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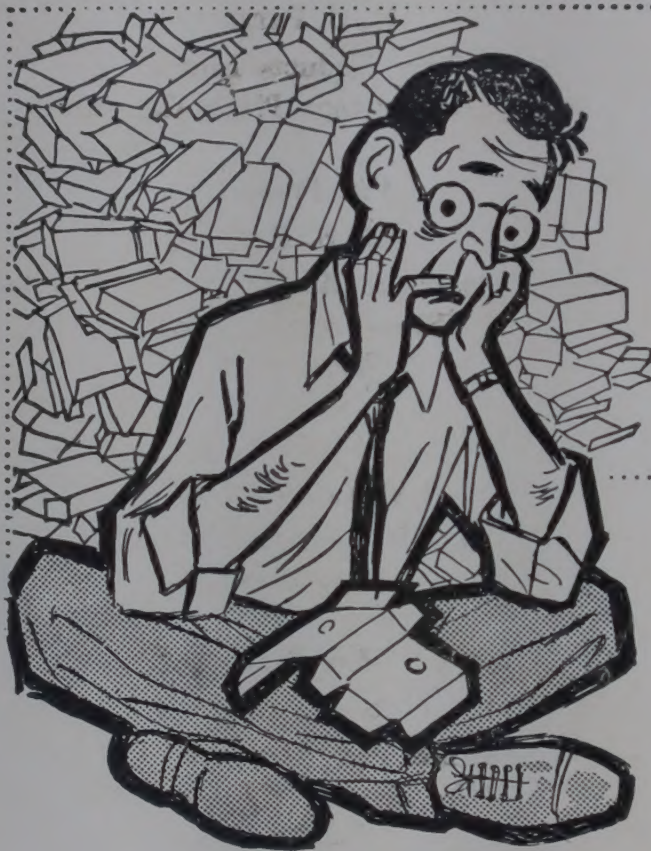


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Editorial

With the growth of the industry, there has been increasing realisation that better use of technology must be made to improve operational efficiency of the factories and raise the quality standards of the products. It would also help to raise the status of the Indian manufactured speciality products on the foreign market.

Technology standards of the industry can only be raised by employing better qualified technologists and giving them proper standing in the industrial organisations. The training provided at the Central Food Technological Research Institute under the F.A.O. International Training Centre is indeed of high calibre. Industry should take full advantage of this.

Another aspect of the problem regarding training of personnel cannot be overlooked. Industry has a number of technologists who have worked over sufficient number of

years and have acquired valuable experience.

If these persons can be given the opportunity of undergoing a comprehensive training leading to Master's degree, they would be of greater value to the industry. It is, therefore, essential that the International Training Centre at the C.F.T.R.I. should reserve a few seats for nominees of the Food Processing Industry. This will be very helpful in upgrading the personnel employed in the industry to take up problems independently relating to research, product development, quality control and improve the productivity. The nominees, of course, should possess the minimum requirement for admission to the course.

The short courses which are being organised at Mysore are also valuable to the industry. It is gratifying to note that the industry is taking full advantage of these opportunities.

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STUDIES ON PREPARATION AND STORAGE OF ASH GOURD PRESERVE BY THE HOT CONTINUOUS CONCENTRATION PROCESS

B. S. RAMACHANDRA, L. S. SUBBA RAO AND S. RANGANNA

(Central Food Technological Research Institute, Mysore, India)

Summary

An equipment, making use of flow of air through the hot syrup for evaporation and controlling the rate of concentrations, has been developed for the manufacture of preserves. The concentration is raised continuously at the rate of 1° Brix per hour at 60°C till the final concentration is reached. The fermentation in the early stages is eliminated. The prepared product is translucent and the syrup clear. Storage changes of ash gourd preserve prepared in this equipment and its cost of manufacture are presented.

Introduction

India produces about 40,000 tons of preserves per year¹ and nearly 10 per cent of this is exported. Preserves are generally made from fruits such as *amla* (*Phyllanthus emblica*), apple, mango, papaya, pears; vegetables like ash gourd (*petha*), ginger, carrot etc., and peels of citrus fruits. The prevailing method of manufacture of preserves in India has been reviewed by the sub-committee of the Central Fruit Products Advisory Committee² and by Siddappa and Sastry³. The method followed is essentially the slow process^{4,5} modified to suit the local needs. The prepared fruit, peel or vegetable after preliminary treatments, is kept covered with sugar initially. The syrup formed is drained and the concentration is raised by adding more sugar, at the rate of 10° Brix per day till the concentration is 60° Brix and thereafter at the rate of 5° Brix till the final concentration of 70-75° Brix is reached. This method of manufacture of preserves has certain drawbacks^{2,3}. The time consumed for preparing is considerable, involves much manual labour and during the early stages

when the sugar concentration is low and the syrup is cold, fermentation invariably sets in, which results in the spoilage or poor keeping quality of the finished product. The absorption of sugar also may not be uniform and may give a discoloured product.

As an improvement over this method, vacuum concentration process has been investigated by Cruess and his workers⁴, and Siddappa and Bhatia⁶. Though the vacuum process gives a good product, it is not commercially practised. Atkinson *et al*⁷ have developed an improved method for candying of fruits, by maintaining the fruit and the syrup at 60°C throughout the process and concentrating the syrup at the rate of 1° Brix per hour for 8 hours per day. The syrup from the unit is continuously withdrawn and concentrated in a cascade or calendria type of evaporator. The drawbacks of this process are: (a) the need for an external concentrating system and pipe line for syrup flow, which is likely to be clogged with the disintegrated pulp of the fruit or vegetable, and (b) the absence of a simple control on the rate of concentration of sugar solution.

After a study of the above processes, an improved equipment has been developed for the manufacture of preserves by the hot continuous concentration process^{8,9}. The present communication is intended to describe the preparation of ash gourd preserve by the hot continuous concentration process and the changes during storage of the canned product.

Experimental

Principle: In the method developed by us, the fruit and the syrup are maintained at 60°C, the concentration of syrup is raised continuously at the rate of 1°Brix per hour by flow of air through the hot syrup, till the final concentration of 70-75°Brix is reached.

The temperature is maintained at 60°C,

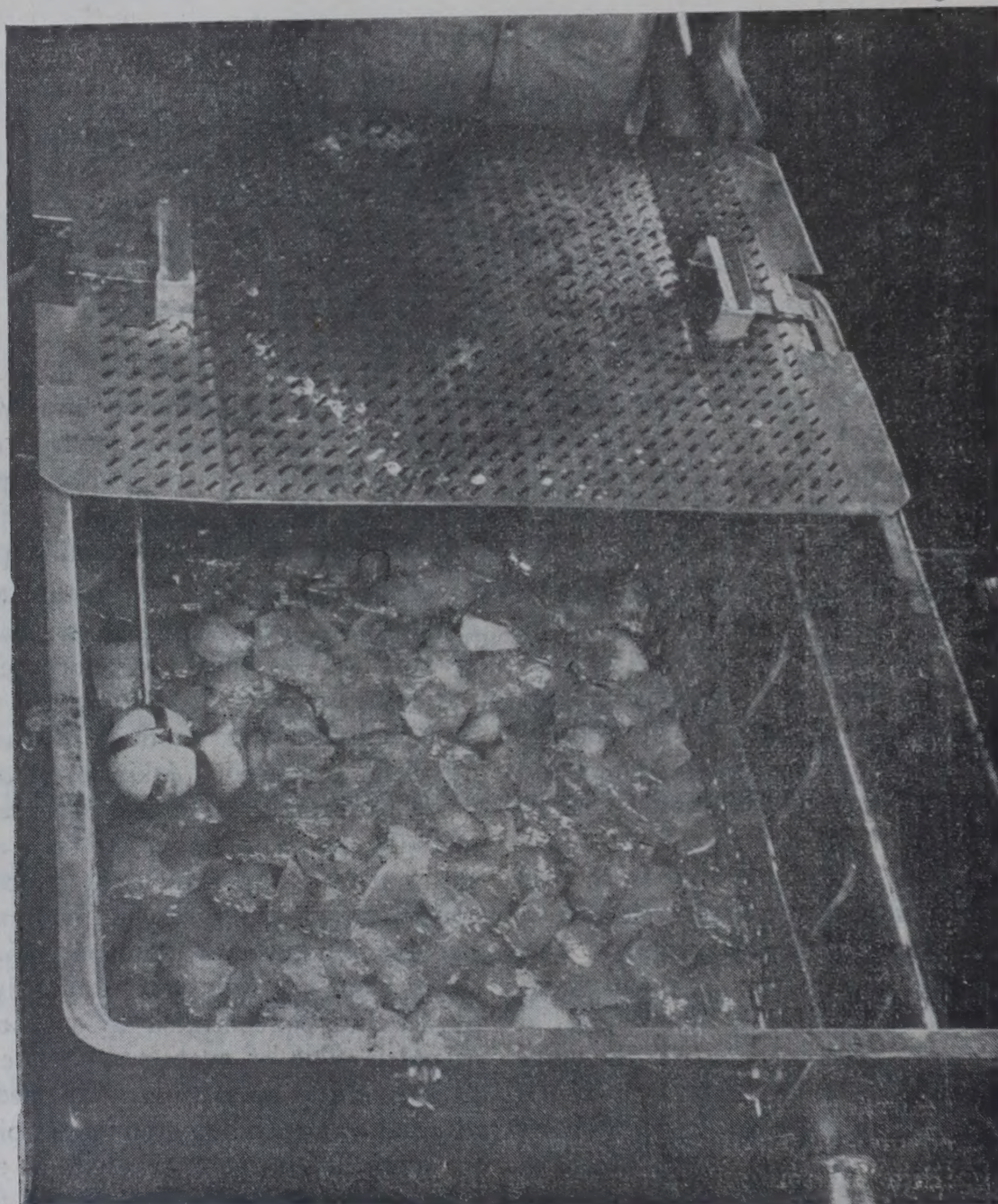


FIG. 1

Interior view of the equipment showing the outer syrup tank, inner perforated tank, float valve, perforated cover plate and ash gourd preserve in syrup

since higher temperatures may cause caramelization of sugar while fermentation may occur at lower temperatures. The air as it escapes from the surface of the sugar syrup carries the water vapour, thereby concentrating the syrup. The resulting fall in the syrup level is made up by adding concentrated syrup. Varying the rate of flow of air will also vary the rate of evaporation of water and thus provides a simple method for controlling the rate of concentration of sugar syrup.

Equipment: The equipment for making preserves is made from stainless steel and consists of (a) an outer syrup tank, (b) inner perforated basket, (c) steam coil and the float valve fixed in the outer tank, (d) a bottom stand in the outer syrup tank

for the perforated basket, and (e) a set of six air distribution tubes [Fig. (1) and (2)].

The outer syrup tank is rectangular in cross section and is provided with a lid having an opening for the escape of moisture laden air. The perforated basket which holds the fruit or vegetable is made from perforated stainless steel sheet, and is provided with two handles for lifting and putting in place in the outer syrup tank. A cover plate provided for the perforated tank keeps the contents well immersed in the syrup. The bottom stand facilitates free draining of syrup from the perforated basket. The steam coil provides the heat transfer area for the evaporation of water. The float valve fixed in the outer syrup tank maintains steady syrup level in the tank by

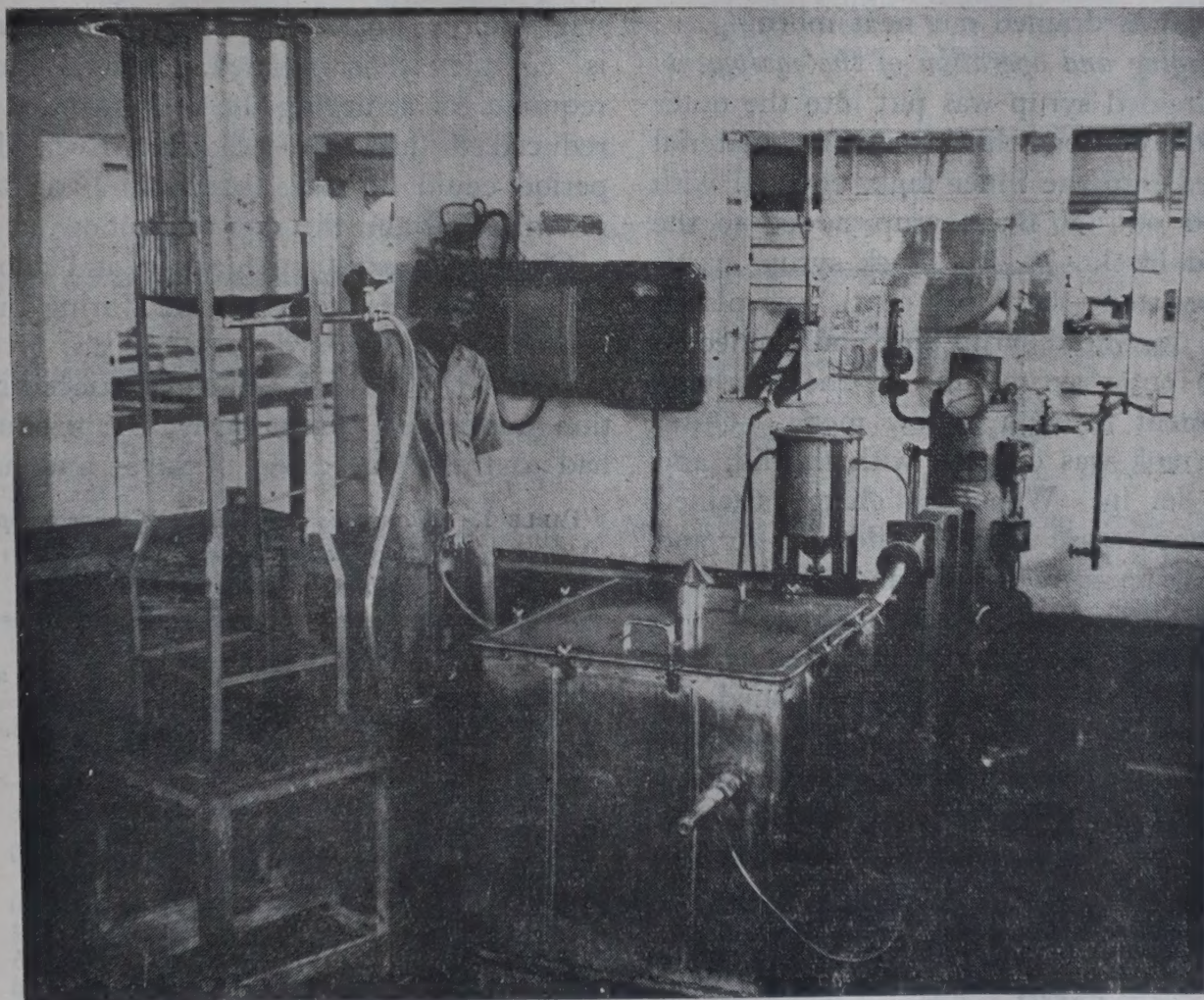


FIG. 2

General assembly of the equipment showing the air blower, thermostat control, stock syrup tank and boiler for steam

allowing the concentrated syrup to flow, as the level of syrup falls due to evaporation of water.

The outer tank is provided with a main air line and air distribution tubes (6 nos.) are fixed to it. A perforated plate with 1/16" dia. holes is welded to the bottom of each tube to facilitate uniform distribution of air. A thermostatic control is fitted to the outer vessel and maintains the syrup temperature at $60^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

Preparation of raw material: Ash gourd was washed, cut into pieces, peeled and pricked. They were then soaked in calcium chloride (1 per cent) solution for one hour, washed and cooked in boiling water till the pieces became tender. The pieces were kept covered overnight with half their weight of sugar and the syrup (30°Brix) formed was drained out next morning.

Charging and operation of the equipment: The drained syrup was put into the outer tank to about one-third its height, material charged into the inner tank, covered with the lid and 30°Brix syrup added to the desired level. 70°Brix stock syrup, partially inverted (10-15 per cent), was placed in the over-head syrup tank and connected to the outer syrup tank of the candying equipment through a flow meter. Outer syrup tank was covered with the lid, and steam let in. When the charge attained the temperature of 60°C , flow of air and stock syrup were started and regulated to give the desired rate of concentration.

Packaging and storage of the finished product: When the product attained the desired final concentration, the syrup was drained out. 560 gm. of ash gourd preserve was filled into plain A2½ cans, covered with 500-520 gm. of hot (102°C) drained syrup, sealed, kept inverted for 5 mts. and then cooled in running cold water. The cans were stored at 5°C , $22-25^{\circ}\text{C}$ (room temperature) and 37°C .

Analytical methods: Cut-out examination of canned product was carried out in the

usual way. Sugars were estimated by the method of Lane and Eynon¹⁰.

Non-enzymatic browning: 10 gm. of sample was adjusted to 10°Brix by diluting with water. 25 ml. of solution was well mixed with 25 ml. of alcohol, left overnight, filtered and colour measured in Spectronic 20 colorimeter at 440 mμ.

Results and Discussion

The equipment developed for the manufacture of the preserves provides an integral concentrating system and a simple control on the rate of concentration. While the labour involved in the preparation of the raw material upto the stage of charging the equipment remains the same, considerable manual labour involved in draining the syrup and concentration through several stages till the final concentration is reached, is completely eliminated. Several days required for achieving the concentration is reduced to just 38-42 hours. Even this period could be varied depending on the raw material and the rate of air flow.

Changes in acidity, pH, sugars and colour with increase in concentration during preparation of ash gourd preserve, are given in Table 1. Though the sugar concentration was raised continuously, the product had uniform absorption of sugar and had

TABLE 1. Changes in composition of sugar syrup with time during preparation of ash gourd preserve

Time (hrs.)	Sugars		pH	Acidity as anhydrous citric acid
	(Reducing as invert)	(Total as invert)		
	%	%		%
0 (at start)	9.0	40	4.40	0.030
4	9.60	45	4.40	0.030
8	11.20	48	4.50	0.032
13	15.10	54	4.40	0.036
18	16.40	59	4.40	0.046
23	18.40	64	4.40	0.043
26	20.60	67	4.40	0.046
29	21.20	70	4.40	0.050

good colour and flavour. By having an inner perforated basket, disintegration of the fruit is completely avoided. Air, which passes through the syrup in the form of fine bubbles at the bottom of the outer syrup tank, causes sufficient turbulence resulting in the uniform mixing of syrup and thus eliminates any possible concentration gradient at different depths of the charge. Quantitative data for one batch of ash gourd preserve made in this equipment is outlined in Table 2.

The drained syrup from the finished product is clear, free from suspended pulp and light in colour. The same syrup could

be used as covering syrup in the canned product and/or as stock syrup in the preparation of subsequent batches of preserves. The left-over syrup after filtering could be used in the manufacture of fruit or synthetic syrups. Left-over syrup from ash gourd preserve when made into synthetic rose syrup had no perceptible difference as compared to that of syrup prepared from sugar directly and was readily purchased by the consumers.

Changes during storage of ash gourd preserve are shown in Table 3. It will be seen from the results that the canned product had remained good even after a

TABLE 2. *Quantitative Data for a batch of ash gourd preserve*

Material	Wt. of material	Wt. of syrup for covering	Wt. of 70° Brix syrup used	Wt. of residual syrup	Wt. of finished product	Wt. of water evaporated (by difference)	Concentration at start	Concentration at finish	Time of rush	Air rate
	kg.	kg.	kg.	kg.	kg.	kg.	°Brix	°Brix	hrs.	litre/min.
Ash gourd	180	165	196	187	169	185	36	70	38	580

TABLE 3. *Changes during storage of ash gourd preserve*

Storage period	Storage Temp.	Drained wt.	pH	Acidity as anhydrous citric acid		Sugars				Degree of inversion		Colour	
						Reducing as invert		Total as invert					
				Fruit	Syrup	Fruit	Syrup	Fruit	Syrup	Fruit	Syrup	Fruit	Syrup
Months	°C	%	...	%	%	%	%	%	%	%	%	O.D	O.D
0		53.0	4.4	0.06	0.05	20.0	21.0	71.0	72.0	28.2	29.0	.009	.004
2	5	57.0	4.8	0.08	0.06	23.0	21.4	72.5	72.0	31.6	30.0	.018	.03
	22-25	58.0	4.6	0.08	0.07	21.0	22.0	72.5	71.0	29.0	31.0	.032	.024
	37	58.0	4.6	0.08	0.07	20.0	23.0	72.5	71.0	27.6	32.0	.027	.032
4	5	57.0	4.7	0.06	0.05	21.5	21.0	72.0	72.5	30.0	29.0	.018	.014
	22-25	58.0	4.6	0.07	0.06	21.2	21.5	71.5	71.0	29.6	30.0	.027	.018
	37	57.5	4.6	0.07	0.07	22.0	24.0	72.0	71.5	30.0	29.0	.092	.070
6	5	56.0	4.8	0.06	0.05	18.6	20.0	71.5	66.5	26.0	30.0	.018	.014
	22-25	58.5	4.9	0.06	0.05	20.4	20.6	69.0	67.0	29.6	30.8	.027	.032
	37	59.5	4.5	0.08	0.07	26.5	29.0	72.0	68.6	37.0	42.3	.102	.110
8	5	59.0	4.7	0.06	0.06	19.6	19.9	72.5	72.0	27.0	27.7	.018	.014
	22-25	62.0	4.7	0.06	0.07	19.8	19.7	72.4	69.0	27.4	28.6	.027	.018
	37	60.0	4.7	0.09	0.10	26.6	28.3	72.0	71.2	37.0	40.0	.092	.114

storage period of 8 months and had good colour and flavour. As can be expected, the canned product stored at 37°C had light brown colour as compared to those stored at 5°C or room temperature. With increase in storage period and temperature, as can be expected, there is slight increase in the extent of degree of inversion and of non-enzymatic browning. Irrespective of storage temperature, the product had good colour and flavour, though the canned product stored at 5°C and at room temperature were lighter in colour and had better flavour as compared to those stored at 37°C.

Unfortunately, the product from the conventional process, when canned similarly as the product from hot continuous concentration process, bulged on a few days of storage and the spoilage was found to be due to the fermentation caused by yeast. Hence comparative data regarding storage changes of the product from conventional process could not be given.

Making use of the equipment developed, preserve has been made from carrot, *amla*, mango, apple and peels of citrus fruits. Commercial manufacturers who examined the product were convinced of the superior quality of the product as compared to their own product prepared by conventional process.

The basic cost data for one batch of ash gourd preserve made in this equipment is outlined below:

Raw materials:		Rs
Ash gourd (400 kg. at 24 paise/kg.)	...	96
Sugar (280 kg. at Rs 1.20/kg.)	...	336
Chemicals (calcium chloride, alum, citric acid, etc.)	...	10
Utilities:		
Power (30 kwh. at 10 paise/kwh)	...	3
Steam (250 kg. at 2.8 paise/kg.)	...	7
Water (1000 glns. approx.)	...	1
Labour:		
90 man hours (30 paise/man hr.)	...	29

Total	...	482
Allocation of cost on products:		
Preserve	...	180 kg.
Sugar syrup*	...	190 kg.

This syrup was used to prepare synthetic rose syrup and sold.

	Rs
220 bottles of synthetic syrup was sold @ Rs 1.50/bottle	330.00
Deduct cost of bottles, chemicals and bottling cost	130.00

Price recovered	Rs 200.00

So, basic cost of manufacturing 180 kg. of preserve is Rs 482 - 200 = 282	
or, cost per kg. is = Rs $\frac{282}{180}$ = Rs 1.60.	

* The left-over syrup could also be used as, (a) covering syrup if the product is canned; or (b) as stock syrup for subsequent batches of preserves, in which case, the cost has to be allocated accordingly.

Acknowledgment

The authors wish to acknowledge the kind assistance given by the staff of the drawing office, workshop and pilot plant of the Institute in designing, fabrication and testing of the equipment and also thank Sri H. C. Bhatnagar, Chairman, Fruit and Vegetable Technology and Dr H. A. B. Parpia, Director, Central Food Technological Research Institute, for their keen interest and discussions during the course of this work.

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BIOCHEMICAL STUDIES IN THE PHYSIOLOGY OF SAPOTA

Part I—PHYSICAL CHANGES

M. V. SASTRY*

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Achras sapota Linn. (or *Achras Zapota* Linn.), belonging to the natural order of sapotaceae, is an important fruit bearing tree of our country and is one of the most adaptable tropical trees. It has been found to thrive a great diversity of soil and climatic conditions. From its original home in South America, it has spread to many lands acquiring during this process a number of names amongst which are sapota, *chiku elluppai*, zapota, *sapodilla*, *sapotille*, *brieapfel*, *nispero*, *naseberry*, *neeseberry*, etc. Propagation is done by seeds, grafting, layering and budding. In India, the plant is grown largely near the sea coast in Maharashtra, Gujarat, Andhra Pradesh, Madras and Bengal States, spreading in less number into the interior. In Maharashtra, only two varieties are distinguished namely round and oval. *Cricket ball*, *Pala*, *Dwarapudi*, *Kirtibathi*, *Gouranga*, *Jonnaivalasa* and *Vavivalasa* are some of the indigenous varieties which are cultivated in this country.

Sapota fruit enjoys much popularity and it is a very delicious one. The fruit is covered with a thin rusty brown skin with yellowish brown, soft and sweet flesh inside, in which are embedded hard black seeds. Fruits are oval or round depending on the variety which are available throughout the year but mainly during March—April and August—September. Mature fruits are harvested in time and ripened in hot places. They are 5-10 cm. in diameter.

Work on the ontogeny of sapota is very

little and scanty. Santos and Ascolon¹ investigated for the nutritive value of sapota. Ganzler² from Philippines has reported some storage and respiratory aspects of the fruit. Phytin content of ripe sapotas has been estimated by Candido L. Bagoisan³. Jose E Carpo⁴ has studied the best storage temperature for sapota. Naik, Shah and Pandya⁵ have reported the analysis of the fruit for its carbohydrate and ascorbic acid contents. Kamath, Pandya and Narayana⁶ reported vitamin C content of sapota fruits that were available in Poona market. Munsell⁷ has determined ascorbic acid content of Peurtorican sapotas. White⁸ has reported on the constitution of sapota gum, Mell⁹ on sapota as a source of saponin, Vidyarthi and Mallaya¹⁰ on fatty acids and glycerides of the oil from sapota seeds, Byrum and Dalle Jr.¹¹ on pharmaceutical and toxicological studies on polyuronide and sapota gum. Bryan and Wintter¹² worked on the gum from *Achras sapota* as suspending agent. Wardlaw¹³ has studied problems of storage and transport of sapota. Singh and Mathur¹⁴ have studied cold storage of sapota. Siddappa and Bhatia¹⁵ have identified sugars in the unripe sapota fruit by paper chromatographic method. Pathak and Bhat¹⁶ have studied carbohydrate metabolism in sapota fruit. Mahadevareddy¹⁷ conducted physico-chemical investigations into *Dwarapudi* and *Kirtibathi* varieties of sapota and its products. Pathak and Bhat¹⁸ have also reported the presence of fairly large microflora in the pulp of the sapota

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fruit. The flora has been shown to be mostly indigenous to the fruit, presumably in the latex.

Before any attempt is made for commercial utilisation of the fruit, a systematic study of the fruit itself is necessary. The present work aims at adding little more to the existing knowledge which is rather meagre. In these investigations an attempt has been made to follow the periodical changes in the main constituents, firstly while the fruits grow on the tree upto matu-

rity and secondly during the short period of ripening after fruits are harvested.

Materials and Methods

Sapota fruits for these investigations were obtained from the Modibagh Gardens of the Agricultural College, Poona. The frequently appearing blossoms presented a considerable problem in marking the flush. This was overcome by removing the new buds formed from time to time, after first-marking of the blossoms. The method

TABLE. *Physical and biometric changes during the growth of sapota fruit*

Age (in days)	Volume c.c.	Weight g.	Density g./c.c.	Rate of increase of fresh wt. during each period g./day	Moisture g.	Dry matter g.	Rate of increase of dry matter during each period g./day	Solid intake Total intake	Remarks
25	2.31	2.40	1.04	0.08	1.69	0.71	0.03	0.38	The fruits are very small. Seeds are not discernible; strongly acrid to taste, no characteristic colour or flavour in the flesh.
50	9.80	10.18	1.04	0.26	7.32	2.86	0.09	0.35	Fruits are small in size, soft mucilaginous seeds are discernible. Fruits are still acrid to taste with no flavour. When picked latex oozes profusely at the stem end.
75	29.49	30.53	1.04	0.68	22.32	8.21	0.21	0.31	Fruits are of medium size, with soft, white seeds and astringent pulp, with no characteristic colour or flavour. Latex oozes when injured.
100	61.49	63.50	1.03	1.10	45.38	17.12	0.36	0.33	Fruits continue to grow. When brown outer skin is scratched green inner skin is discernible. Flesh is slightly honey coloured in the central portions surrounding partial black coloured hard seeds. Astringent with no flavour.
125	90.10	93.33	1.03	0.96	68.58	24.75	0.31	0.32	Fully grown fruit with honey coloured flesh, yellow skin is seen below brown outer skin, mixed taste of sweetness and astringency with no flavour. Seeds are black and hard.
135	90.27	93.30	1.03	...	...	...	...	...	No further noticeable growth and changes of any discernible magnitude.

of sampling and analysis is the same as for guava¹⁹, except in sapota the seeds are removed and the edible pulp of the fruit is used for estimations. The fruits were collected at regular intervals of 25 days.

Results and Discussion

After bringing the fruits to the laboratory, the physical characteristics are noted. They are given in the Table. The fruits mature and get ready for commercial harvest in about 125 days. The changes in the weight and volume (Fig. 1) run parallel to each other. This is further demonstrated by the constant values of density throughout the fruit growth. Upto fifty days, there is very little growth as shown by the weight and volume, after which there is a rapid increase till the fruit matures on the tree. There is ten times increase in both these values from

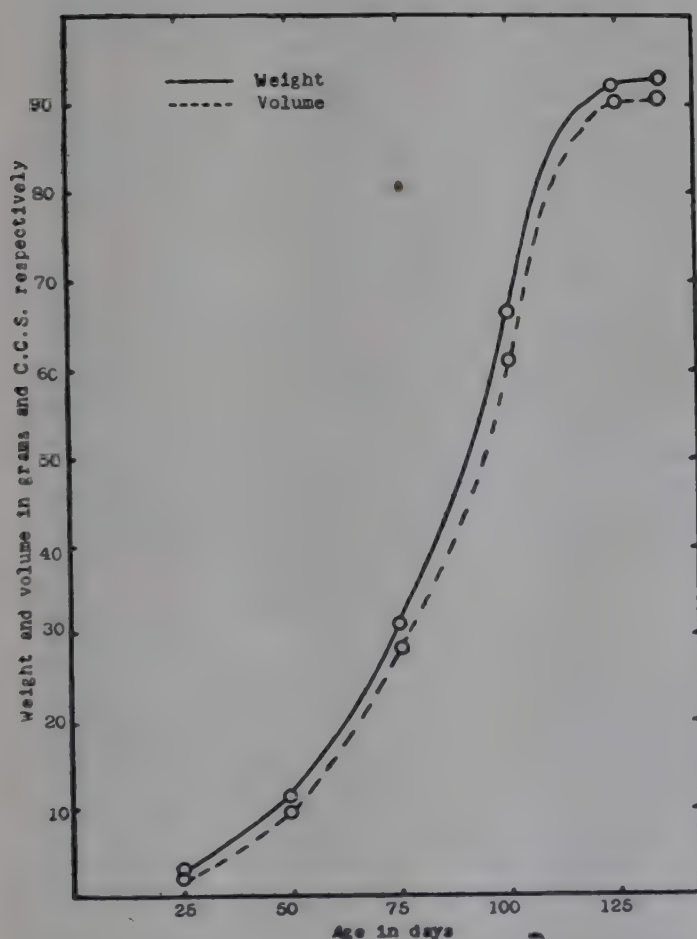


FIG. 1

Weight and volume of Sapota

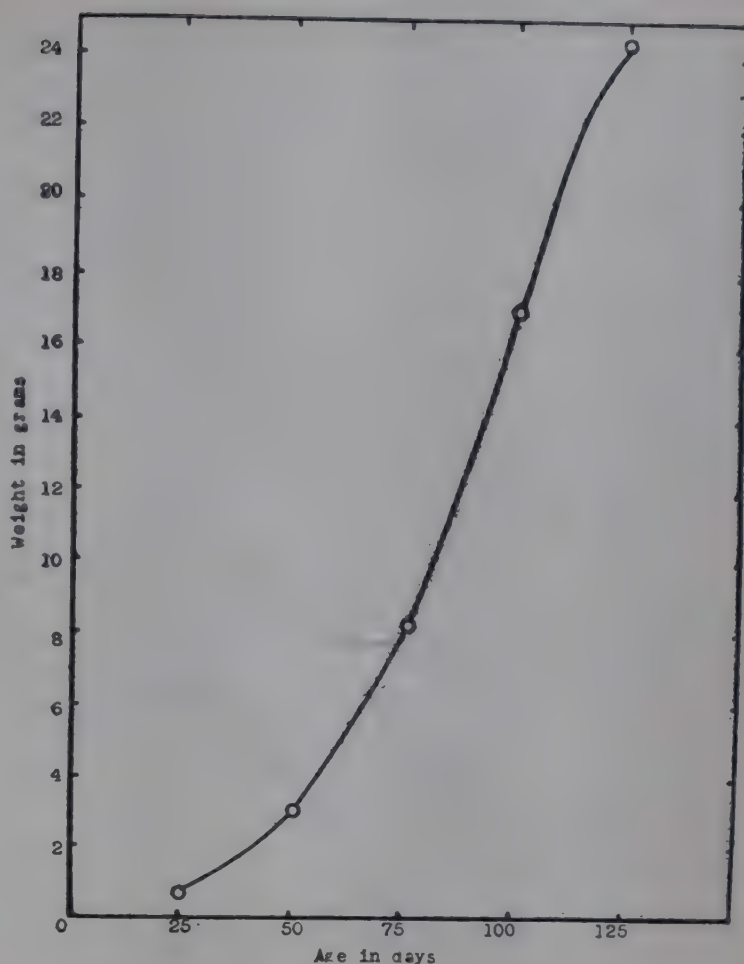


FIG. 2

Dry matter

fifty to hundred and twentyfive days. The fruits will not register any increase either in volume or in weight after this period. This is considered to be the right time to pick the fruits and ripen them in warm place. The pattern of growth in weight and volume follows an autocatalytic sigmoid relationship as it happens in other fruits^{20, 21}. The rate of increase of fresh weight of the fruit has been slow upto fifty days, thereafter it uniformly increases upto hundred days, after which it is found to slacken.

Dry matter (Fig. 2) and moisture in the fruit go on accumulating till the fruit is matured on the tree. The rate of increase of dry matter (Fig. 3) is rather slow in the early stages. During the end stages of enlargement and maturity, dry matter fills rapidly into the fruit.

The ratio between rate of increase of dry weight to that of the rate of increase of

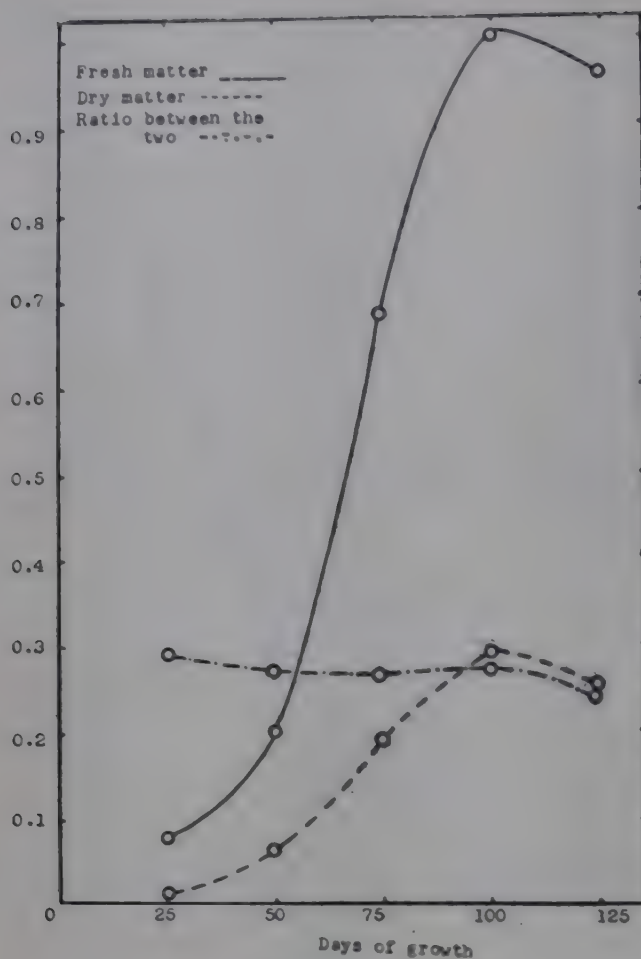


FIG. 3

Rates of increase of fresh matter, dry matter and the relation between the two

fresh weight of the fruit (Fig. 3) may be considered to represent the concentration of the total solids in the cellsap of the fruit. It can also be known as the ratio between the rate of solid intake to total intake. It could be seen from the table that this ratio is rather high in the initial stages when compared to the maturity period. This bears that the rate of increase of solid matter which fills into the fruit is dominating over moisture in the initial stages. Afterwards this ratio is almost constant, showing that the rate of filling of solids and moisture are keeping pace with each other.

Density of the fruit is almost constant throughout although there is a discernible change in the later two stages when compared to the earlier period. This discrepancy of behaviour of the specific gravity or density when compared to other qualities

is mostly due to the growth of seeds which were not considered for all the other estimations whereas the density is done for the whole fruit while other estimations were carried out only with edible portion of the fruit.

According to these results, the life of the fruit can be divided into five distinct stages as follows: (i) juvenile or early stage upto twentyfive days, (ii) enlargement or adolescent stage from twentyfive to seventyfive days, (iii) mature or climacteric stage from seventyfive to hundred and twentyfive days, (iv) ripening, and (v) senescent stages. The last two stages are passed only when the fruit is picked at the proper time and ripened. The changes in the other substrates will be discussed in the subsequent papers.

Summary

1. According to physical characteristics, *cricket ball* variety of sapota may be harvested between 125 to 130 days from start for their profitable marketing.

2. Development of the fruit regarding biometric parameters may be represented by sigmoid curves indicating autocatalytic growth.

3. The life of the fruit on the tree can be divided into three stages while the life after picking the fruit can be represented by another two stages. Totally the life of the fruit can be divided into five important phases of life, the first phase being evident by about 50 days from the date of flowering.

Acknowledgment

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BIOCHEMICAL STUDIES IN THE PHYSIOLOGY OF SAPOTA

Part II—MAJOR CHEMICAL CONSTITUENTS

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In the Part I of these series¹, physical changes which will take place in the sapota fruit during growth and development have been discussed. Major chemical changes in the ontogeny of the fruit are being discussed in this paper.

Materials and Methods

The collection of materials and the analytical methods, which are being followed in this connection, are as given earlier^{1,2}.

Results and Discussion

Cellwall materials: Alcohol insoluble matter of the fruit pulp is made up of cellwall materials like hemicelluloses, cellulose, pentosans, lignins, pectins, insoluble proteins, starch, etc. But the cellwall material which is given in Table 1 is considered to contain all the above constituents excluding protein and starch. During the period of rapid growth of the fruit, there is a steady decrease in the alcohol insoluble matter when it is expressed on percentage basis. Although in terms of percentage this fall appear to be large, in terms of per fruit basis, however, there is a definite increase during development. The small but a significant decrease in the rate of synthesis of alcohol insoluble matter in the fruit towards the end of development may be due partly to alcohol insoluble matter getting converted to alcohol soluble matter as part of carbohydrate metabolism of the fruit. A similar observation was made by Pathak and Bhat³.

TABLE 1. *Changes in cellwall materials (on fresh weight basis) with maturity*

Particulars	Age (days)				
	25	50	75	100	125
Dry matter (%)	29.45	28.04	27.20	26.95	26.52
Dry matter (%) (Per fruit) ...	0.71	2.85	8.31	17.06	24.75
Cellwall material (%)	17.59	18.12	13.21	10.63	7.91
Cellwall material (%) (Per fruit) ...	0.42	1.84	4.03	6.75	7.39
Hemicellulose (%)	4.63	4.00	3.40	2.89	2.57
Pentosans (%)	2.76	2.25	1.73	1.40	1.41
Total					
pectins (%)	3.32	5.31	2.49	1.04	1.28
Cellulose (%)	1.91 ³	1.81	1.76	1.60	1.55
Lignin (%)	4.45	3.95	2.90	2.03	1.03

Almost a similar trend could be seen in the dry matter also.

On the percentage basis there is a decrease in the alcohol insoluble matter. This may be attributed to the decrease in percentage of hemicellulose and lignin which go on decreasing as the fruit reaches maturity (Fig. 1). Cellulose is almost constant throughout the growth period. Pectin contents increase upto fifty days, till the seed formation takes place, thereafter declining sharply. However, there is a slight increase in pectin content towards the end of the fruit growth at the time of attainment of maturity. The decrease of cellwall constituents was reported by earlier workers with different fruits. Pathak and Bhat³

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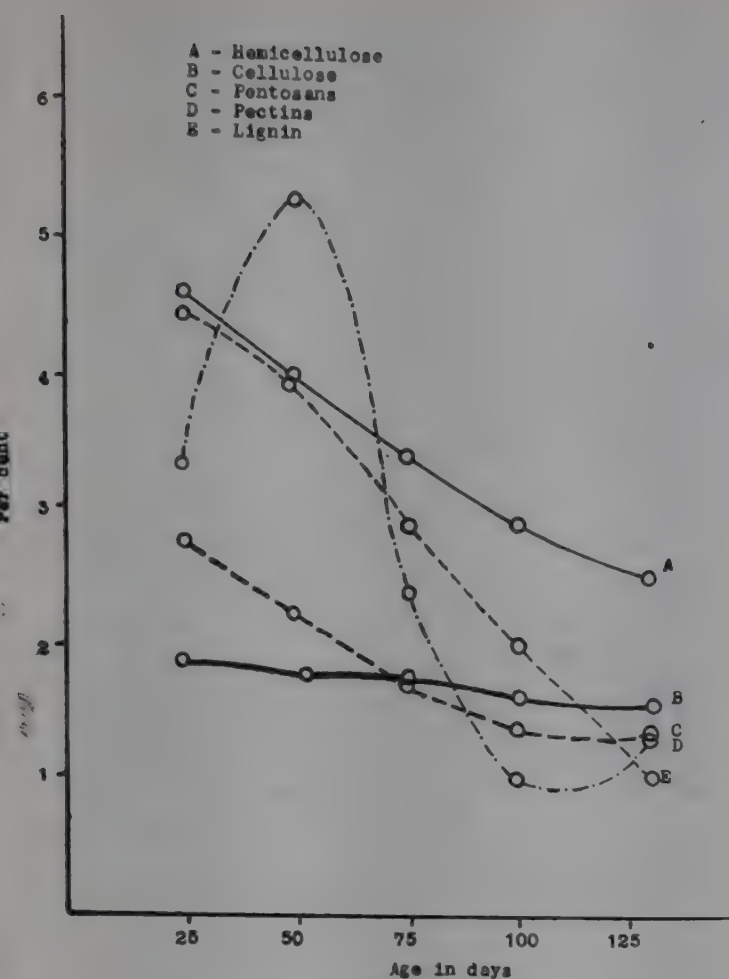


FIG 1

**Changes in cellwall materials
in sapota fruit during growth**

TABLE 2. Variation in carbohydrates and acidity
(on % fresh weight basis) with maturity

Particulars	Age (days)				
	25	50	75	100	125
Starch ...	2.31	1.92	2.02	2.06	1.72
Total sugars ...	0.71	2.57	6.08	10.70	12.77
Reducing sugars	0.59	1.58	5.06	4.63	5.44
Non-reducing sugars	0.12	0.99	1.02	6.08	7.33
Fructose	0.23	0.32	1.33	2.13	2.86
Glucose	37	1.26	3.73	2.50	2.60
Fructose/Glu- cose ratio	0.63	0.26	0.36	0.85	1.09
Fructose + $\frac{1}{2}$ sucrose/Glu- cose + $\frac{1}{2}$ suc- rose	0.11	0.15	0.43	0.93	1.05
Acidity (as an- hydrous malic acid)	0.43	0.30	0.26	0.20	0.06
pH	5.20	5.91	6.22	6.35	7.02
Sugar/Acid ratio	1.65	8.57	23.40	53.50	2.36

observed a decrease in alcohol insoluble as well as hemicellulose contents throughout the growth of the fruit. In guava², cellulose, hemicellulose, lignin and pentosans are found to increase in the early stage and then sharply decline whereas in case of sapota they are decreasing constantly from the beginning. This may be due to cell formation and cell division activity not keeping pace with the vacuolar additions to the fruit even from the very early stage of observation.

Carbohydrates

The drift in the carbohydrate metabolism in the developing fruit is given in Table 2. It would also be seen from Fig. 2 that starch

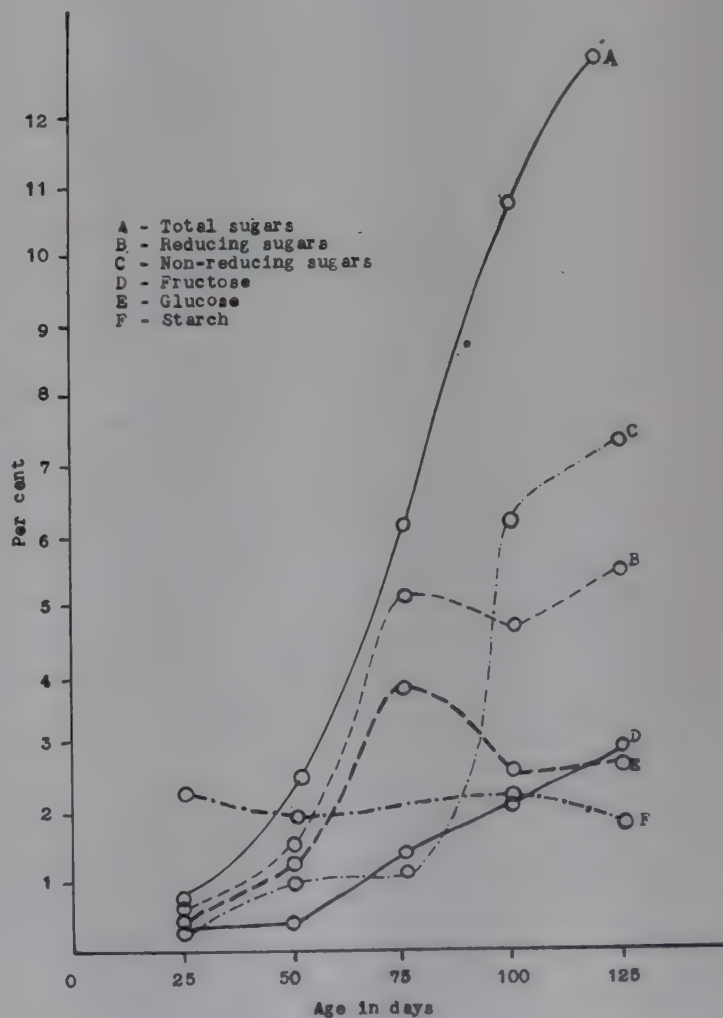


FIG 2

**Changes in sugars and starch in sapota
fruit during growth**

synthesis dominates all other carbohydrates in the early period. Starch content is practically constant throughout the growth which indicates that it is not stored up in the fruit but gets hydrolysed into sugars as it is synthesised. In guava, starch synthesising activity reaches maximum in the early stages and then steadily decreases. A correlation was noticed in starch synthesis and pH of the cell material, in guava⁴, pear⁵, peach^{6,7} and apple⁸. In case of banana⁹ and mango¹⁰, there is a continuous accumulation of starch so long as the fruit continues to grow on the tree. Sapota is a different variety of fruit when compared to any of these fruits. This is neither starchy like banana and mango nor acid fruit with increasing acid synthesis during the growth of the fruit. Quite a different relationship of pH and starch is noticed in this case which shows an opposing trend of starch and pH as starch goes on decreasing while pH goes on increasing with the fruit growth.

Total sugars are mainly made up of reducing sugars upto 75 days. The sucrose content is more in proportion to reducing sugars in the later part of the growth period specially during the onset of maturity in the fruit. At this stage, non-reducing sugar is the chief cause of sweetness in sapota, while fructose dominates in guava². It is curious that during juvenile and the beginning, sugar is not a major constituent. It increases after 75 days. This cannot be accounted as being due to reduction of alcohol insoluble matter alone. It may be that the non-reducing sugars of the fruit have their origin in the latex of the fruit presumably which exist in a polymerized insoluble state during maturation, and later converted to non-reducing sugars. Pathak and Bhat¹¹ have tried to explain the high sucrose content during the later period of growth in sapota as being either due to enzymic action or the microorganisms associated with the fruit.

Reducing sugars contain both fructose

and glucose. It could be seen from Fig. 2 that total reducing sugars increase rapidly upto 75 days and slightly decrease afterwards, remaining almost constant at that level till the fruit reaches maturity. From the beginning to the end of the enlarging stage, there is preponderance of glucose over fructose. Thereafter fructose also increases slightly exceeding glucose. This is evident by the fructose-glucose ratio which is less than unity upto 100 days beyond which it becomes almost one towards the end of the mature stage. Non-reducing sugar should consist at least 50 per cent in the form of glucose. It is seen that the ratio of fructose + $\frac{1}{2}$ sucrose to glucose + $\frac{1}{2}$ sucrose is always less than unity which gradually increases finally reaching unity at the end. This fruit resembles mostly mango and banana rather than guava and apple in its behaviour of synthesising sugars. Unlike many other fruits, non-reducing sugars dominate in the mature stage, contributing for the sweetness in the developed fruit of sapota.

Protein

The total protein content on the percentage basis increases upto 50 days (Fig. 3). The soluble and insoluble proteins also behave similarly. The early increase of the protein content may be due to cell formation and cell division activities. Like in other fruits insoluble fraction of the protein content dominates over soluble protein during development. From Table 3, it can be seen that there is a slight decrease in the ratio of alcohol insoluble matter to protein in the initial stage. This registers a gradual increase upto 100 days after which it shows a rapid increase during the last stage. Similar trend is observed also with the starch-protein ratio, while total sugars-protein ratio keeps pace with growth of the fruit. Thus the changes in sapota during maturation are similar to many fruits except in starch-protein ratios.

TABLE 3. Changes in the protein synthesis of sapota fruit during its development (% of fresh fruit)

Particulars	Age (days)				
	25	50	75	100	125
1. Total protein	2.18	2.43	1.41	0.77	0.60
2. Insoluble protein	1.90	1.97	1.31	0.66	0.51
3. Soluble protein	0.28	0.46	0.10	0.10	0.09
4. Alcohol insoluble matter/protein	8.07	7.46	9.36	9.87	15.95
5. Total sugars/protein	0.33	1.06	4.21	12.51	21.28
6. Starch/protein	1.06	0.79	1.42	2.67	3.42

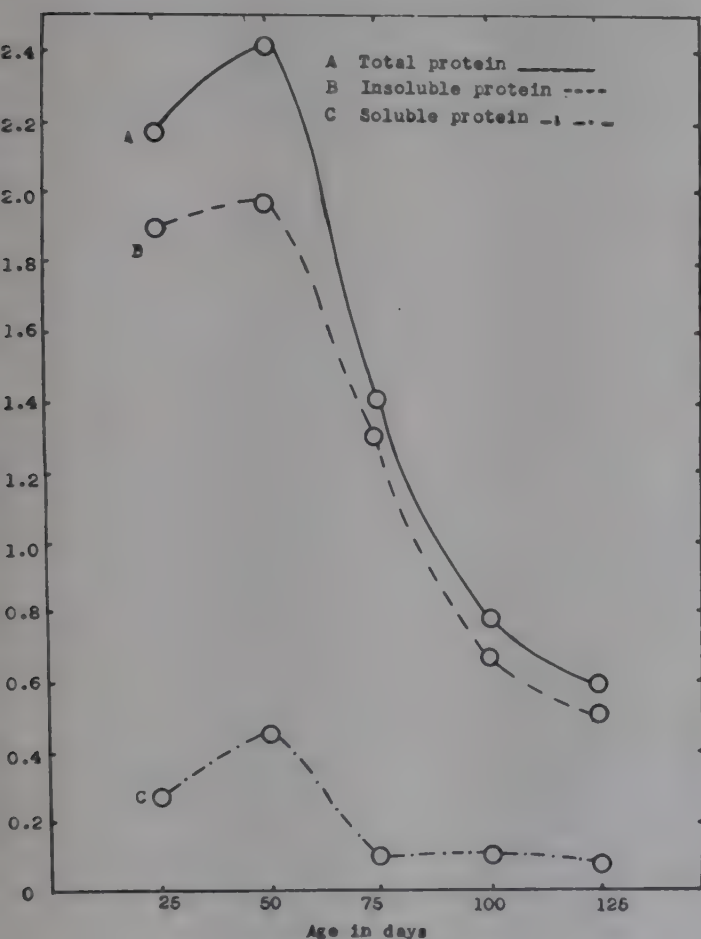


FIG 3

Changes in protein fractions during development of sapota fruit

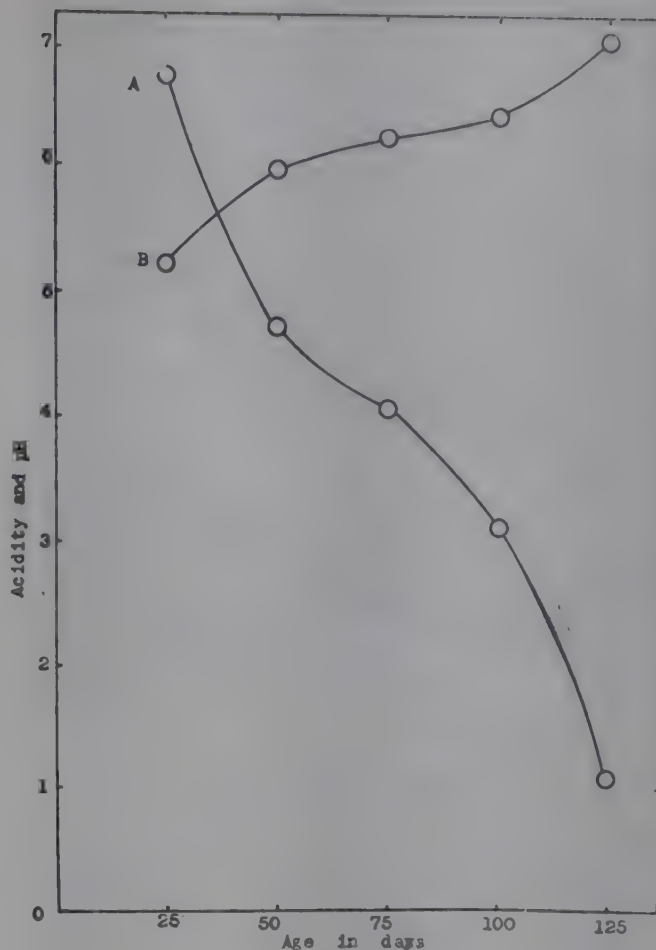


FIG 4

Changes in pH and acidity during the growth of sapota fruit

A—Acidity (cc. of NaOH of 0.1 N normality required by 100 g. of fresh fruit pulp)
B—pH

pH and acidity

Acidity (Fig. 4) decreases sharply upto 50 days. The curve which is less steep at adolescent period takes a sharp decline during the last stage of maturity. The pH of the fruit sap becomes neutral by the final stage of its growth. Unlike many other fruits, the acidity which is comparatively more in the initial stages of the fruit development goes on decreasing as the fruit attains maturity. pH and acidity behave inversely to each other, conditioned by the buffering qualities of the fruit.

Summary

The major activity during the growth of the sapota fruit appears to be the cell

division and cell formation which could be seen in protoplasmic synthesis. Of all the cellwall materials, hemicellulose and lignin are similar in their synthesis, being almost parallel to each other and linear as it is evident from Fig. 1. Cellulose is almost constant throughout; pectin synthesis is completely different from all these constituents.

Increase in total sugars could be expressed as an epsilon curve. Fructose registers a constantly increasing trend while reducing sugars and glucose are similar in their synthesis. Non-reducing sugars being the dominant of all sugars during the final stages resemble almost total sugars in its synthesis. Starch is almost constant throughout the growth.

Acknowledgment

The author wishes to express his indebtedness to Dr N. Narayana, Agricultural Chemist to the Government of Bombay, and Dr H. G. Pandya, Assistant Professor

of Agricultural Chemistry, Agricultural College, Poona, for their keen interest in the work and to Dr L. V. L. Sastry for his helpful comments and his assistance with manuscript.

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THE MARKET FOR MANGO PRODUCTS IN UNITED KINGDOM

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Introduction

The mango is widely grown throughout tropical and sub-tropical regions and although it is mainly eaten fresh as a dessert, various products may be prepared from the fruit and there is considerable interest in several producing countries in the possibilities of utilising supplies of fruit surplus to the requirements of the fresh fruit market for processing. Unfortunately, the mango has the tendency to be an irregular bearer and a heavy drop is usually followed by a very light one, although at times the cycle is not strictly biennial, and it is by no means unknown for several poor crops to be obtained in consecutive seasons. This is a serious handicap to the establishment of a processing industry since it is difficult for a factory to regulate supplies and in a poor season serious shortages are likely to occur which usually result in the fresh fruit fetching high prices on the local markets.

The principal mango products entering international trade at present are mango chutneys (including pickles), canned mangoes in syrup and mango slices in brine. However, statistical information relating to the production and trade in these products is very scanty so that it is impossible to obtain a reliable indication of the quantities of the various products shipped overseas from the producing countries. Nevertheless the demand for most mango products is very limited; in fact, the United Kingdom provides the chief outlet and consumption in most other countries, particularly those in Western Europe, is small.

Mango Chutneys and Pickles

The Indian Export Trade

The production of mango chutneys and pickles for export has been carried on for many years in India and processors there are very experienced in meeting the requirements of overseas buyers. Sweet Mango chutney is the principal type produced, although limited quantities of specialised chutneys prepared according to the recipes of individual processors are also exported, mainly to Middle Eastern countries. As will be seen from Table 1, exports of Mango chutney and pickles from India amounted to 1,398 tons in 1964/65 compared with 1,273 tons in the previous year and 597 tons in 1959. This rise in exports is due mainly to increased sales having been made in recent years to countries such as the United States, the German Federal Republic and the Netherlands. Nevertheless the United Kingdom continues to be the principal purchaser of Indian Mango chutney and pickles and in 1964/65 took 610 tons, or 44 per cent of the total exports. Indian exports to the United Kingdom have tended to increase in recent years and since 1961 have averaged some 679 tons a year compared with an annual average of 370 tons in the late nineteen fifties.

Iraq provides the second most important market for Indian chutney and in 1964/65 took 353 tons compared with 273 tons in the previous year and 246 tons in 1957. Shipments to the United States, the third most important purchaser, have shown a more

TABLE 1. *Mango pickles and chutney—Exports from India*

		1957	1958	1959	1960-1961 Jan.-Mar.	1961-1962 April-Mar.	1962-1963 April-Mar.	1963-1964 April-Mar.	1964-1965 April-Mar.
TOTALS	Tons £'000	941 130.5	795 113.0	597 84.4	1,321 188.6	1,186 171.5	1,315 188.7	1,273 182.2	1,398 211.1
of which to:									
United Kingdom	Tons £'000	489 62.5	387 50.4	234 30.6	479 59.1	610 76.8	861 105.1	635 76.3	610 81.6
Iraq	Tons £'000	246 29.5	216 26.9	173 19.4	538 78.0	298 39.2	200 29.6	273 38.1	353 43.9
United States	Tons £'000	33 8.2	51 9.5	42 8.6	30 6.8	48 12.8	51 13.8	66 14.7	110 23.7
Kuwait	Tons £'000	13 2.8	20 3.6	35 5.4	14 2.3	18 3.2	21 4.1	25 5.1	35 6.8
German Federal Republic	Tons £'000	5 0.8	4 0.7	2 0.4	5 0.9	10 1.9	19 3.2	22 3.6	39 6.5
Malaysia	Tons £'000	27 7.5	23 6.1	14 3.6	24 6.5	17 5.7	38 10.1	21 5.8	28 8.0
Saudi Arabia	Tons £'000	41 3.9	22 2.4	32 3.3	48 4.8	30 2.9	26 2.6	20 2.7	73 9.5
Netherlands	Tons £'000	2 0.3	3 0.4	3 0.5	8 1.5	19 3.2	16 2.3	19 2.7	37 5.5
Canada	Tons £'000	20 3.3	13 2.7	7 1.5	15 3.5	20 4.4	22 4.6	17 3.9	23 6.0
U.S.S.R.	Tons £'000	— —	— —	— —	— —	— —	— —	68 9.3	— —
Bahrein, Aden, etc.	Tons £'000	18 2.6	20 3.5	19 3.8	10 1.8	9 1.4	20 3.9	25 5.3	20 4.0
Hong Kong	Tons £'000	6 1.7	9 2.3	7 1.7	9 2.0	11 2.6	11 2.7	12 3.3	13 3.8
Italy	Tons £'000	— 0.1	15 1.1	1 0.2	32 2.9	— 0.1	1 0.5	— —	— —
Other countries	Tons £'000	41 7.3	12 3.4	28 5.4	109 18.5	96 18.3	29 6.2	70 11.4	57 17.2

— Nil or negligible.

1960 shows 15 months.

Source: Foreign Trade of India, Department of Commercial Intelligence and Statistics.

or less steady upward trend in recent years and have increased from 33 tons in 1957 to reach 110 tons in 1964/65. Other markets of lesser importance include Kuwait, the German Federal Republic, Malaysia, Saudi Arabia, the Netherlands, Canada, Bahrein and Hong Kong. It is of interest that Indian exports to both the German Federal Republic and to the Netherlands

have increased from 5 tons a year or less in the late nineteen fifties to 39 tons and 37 tons, respectively, in 1964/65.

The United Kingdom Market for Mango Chutney and Pickles

The main outlet for mango chutney in the United Kingdom is the preparation of various chutneys, pickles and fruit sauces and for

this trade sweet mango chutney is imported, which consists of mango slices usually packed in wooden barrels, of 25 or 40/42 gallon capacity, in a heavy spiced syrup of 60 per cent total solids. Most manufacturers in this country have their own rather specific requirements regarding the quality and constituents of the chutney, and in this connection many Indian producers have the advantage that they are very experienced in meeting the particular specifications of purchasers. Nevertheless lack of consistency is often a serious problem since the quality of the mangoes used can vary according to the availability of the fruit from season to season. Buyers in this country, however, are of the general opinion that many producers in other regions, such as the Caribbean and East Africa, who have attempted to compete with India in this trade, have found it very difficult to obtain sufficient supplies of fruit to produce a product of reasonably consistent quality. In this connection, it is of interest that one of the leading chutney manufacturers in this country recently announced plans to organise the production of mangoes in Australia in order to obtain continuity of supplies and to meet their specific requirements as regards quality.

Most manufacturers specify that mango chutney must be prepared from fully developed sound fruit and that it should be reasonably free from fibrous tissue and completely free from off-flavours, particularly the paraffin flavour, often associated with many types of seedling mangoes. It is difficult to assess the quantities of mango chutney used by sauce and pickle manufacturers in this country since most firms make purchases in advance of their immediate requirements and hold considerable stocks to protect themselves against crop fluctuations. However, the general opinion from the trade is that sales are fairly static.

In addition to the demand from sauce

and pickle manufacturers, increasing quantities of various specialised mango chutneys are being imported into the United Kingdom and bottled here for retail sale, mainly to the immigrant population. This trade is in the hands of a comparatively large number of small firms and has increased considerably in recent years, although there are indications that it has probably reached saturation point. For bottling for retail sale, much of the chutney is packed in small barrels of 12½ gallons capacity and there is also a demand for these small barrels of chutney from some of the larger Indian and other Asiatic restaurants which have become established in London and certain other large cities.

Prices paid for mango chutney vary a good deal, but currently average quality Indian packs from established producers are fetching between 150 and 175 per cwt. ex-quay, United Kingdom, and importers in this country are of the general opinion that new producers would probably find it difficult to compete as regards price. The lower priced chutney is generally used as a base in the preparation of certain cheaper brands of fruit sauces, while the higher priced product, which is often designated 'bottling quality', is utilised in the preparation of certain mango chutneys and pickles or is just repacked in glass bottles for retail sale.

Mango Slices in Brine

Mango slices in brine are a specialised product imported into the United Kingdom and certain other countries, such as the United States, for use in the preparation of high class mango chutneys. Supplies at present are obtained mainly from India and Jamaica and it is understood that over a number of years several other countries have attempted to develop the production of this product for export, but have found it difficult to compete in the limited market as regards quality and price with the two

established producers. Mango slices in brine were not shown as a separate item in the Indian Trade Returns until 1964/65 (April/March) when exports totalled 448 tons, valued at £37,600, and of this total 432 tons, valued at £34,700 were consigned to the United Kingdom and 10 tons to the Soviet Union.

Exports of mango slices in brine make up the major proportion of Jamaican exports of mango products, details of which are given in Table 2. This item also includes mango slices in syrup and chutney, but the quantities of these products shipped from Jamaica are known to be very small. Examination of Table 2 shows that Jamaican exports of mango products amounted to 418 tons in 1964 and 413 tons in 1963, compared with 621 tons in 1962, 907 tons in 1961 and only 311 tons in 1960. The United Kingdom takes the bulk of the Jamaican exports, followed by the United States and only insignificant quantities are shipped to other markets, such as Canada

and Australia. For example in 1964, the United Kingdom took 324 tons, or 77 per cent, of the total exports and the United States the remaining tonnage.

The United Kingdom Market for Mango Slices in Brine

The demand for mango slices in brine in the United Kingdom is very limited and the product is regarded as a speciality item since it is used by a small number of firms who have been manufacturing their own particular brands of mango chutney for many years. These chutneys are usually prepared from special recipes developed by the particular manufacturer and the chutneys are generally more bland than true Indian mango chutneys and are therefore, more suited to the average British palate. For the trade, the mango slices are prepared from fresh unripe but fully developed fruit which must be free from fibre and terpene or paraffin off-flavours. In India, the peeled fruits are often cut into small slices, salt is

TABLE 2. *Mango Products—Exports from Jamaica*

		1957	1958	1959	1960	1961	1962	1963	1964(a)
In brine, syrup, whole or sliced	Tons £	235 20,343	438 27,989	212 26,067	309 21,333	904 46,536	621 31,944	413 22,009	413 31,978
Pulp	Tons £	2 100	— —	10 4,991	2 231	3 435	— 37		5 1
TOTALS	Tons £	237 20,443	438 27,989	222 31,058	311 21,564	907 46,971	621 31,981	413 22,009	418 31,979
of which to :									
United Kingdom	Tons £	177 11,936	401 25,373	134 24,221	259 17,142	833 40,890	573 28,109	339 16,052	324 24,827
United States	Tons £	60 8,500	37 2,616	88 6,778	49 3,766	74 6,018	48 3,872	70 5,427	88 6,911
Canada	Tons £	— —	— —	— 53	1 230	— 51	— —	3 239	
Australia	Tons £	— —	— —	— —	2 389	— —	— —	1 17	
	Tons £	— 7	— —	— 59	— 37	— 12	— —	— 120	

— Nil or negligible.

(a) Subject to amendment.

... Information not available.

Source: External Trade of Jamaica, Department of Statistics.

then added at the rate of 10 lb. per 112 lb. of slices, and the salted slices packed into wooden barrels containing a little water. The product is left to stand until the slices are saturated with brine, usually for some six to eight days. The surplus brine is then drained off and the slices repacked into 5 cwt. barrels. Some Indian processors pack the mango slices in a 15 per cent solution, for local chutney manufacture and for the export trade.

For the United Kingdom market, it is essential for mango slices in brine to have a good texture, free from coarse or fibrous tissues and the fruit should be firm and not have the tendency to form a pulp when processed. There is a preference for pale coloured almost white slices, since certain manufacturers consider that yellow slices have been prepared from over-ripe fruit and are therefore extremely liable to disintegrate. Most firms purchase their stock well in advance of their actual requirements, since supplies of this specialised product are often erratic owing to seasonal variations in the mango crop; in addition it is also considered beneficial to hold the mango slices in store so that they mature properly. It would appear that the demand for this product on the United Kingdom market is fairly static and it is unlikely that in the foreseeable future there will be any marked increase in consumption of the various products which utilise mango slices in brine as a basic ingredient. Currently average quality mango slices in brine are fetching approximately £16/10 per 5 cwt. cask, f.o.b., Bombay.

Canned Mangoes in Syrup

Compared with the well-known canned fruits such as peaches and pineapples, the demand for canned mangoes in syrup is extremely limited and the pack is regarded very much as a speciality item since the fruit and its flavour are relatively unknown to a large number of consumers. In fact, the

widespread inquiries which the Institute has made have not disclosed any large market for canned mangoes in the United Kingdom, on the Continent, or in the United States. Unfortunately, there is no worthwhile statistical information available regarding the production, export trade, or import trade relating to this canned fruit so that it is impossible to obtain any reasonably accurate estimate of the quantities entering international trade.

The United Kingdom Market for Canned Mangoes

It would appear that the United Kingdom offers the principal market for canned mangoes and the general opinion of the United Kingdom canned fruit trade is that imports currently amount to between 25,000 and 30,000 standard cases a year, although one importer did suggest that the trade had recently increased to about 40,000 cases and that the optimum requirements of this market at present were 50,000 cases a year. Thus, in all probability, imports of canned mangoes into the United Kingdom amount to approximately 300 tons a year and are therefore negligible when compared with canned pineapple, imports of which amounted to over 56,500 tons in 1964.

The Republic of South Africa is the main source of supply at present followed by India, Tanzania, the West Indies and China and it has been estimated that in normal years South Africa supplies 60 per cent of the United Kingdom imports, followed by India and Tanzania who each supply 12½ per cent. Thus, the West Indies (Jamaica and Dominica) and China are only very minor suppliers. Canned mangoes are imported into the United Kingdom either in the form of narrow slices, or the cheeks which are somewhat similar to peach caps. There are two principal types of pack sold on this market, a high quality dessert type fruit which is obtained mainly from India and the somewhat lower quality smaller

African fruit which comes chiefly from the Republic of South Africa and Tanzania.

Indian canned mangoes are produced mainly from dessert varieties of fruit, such as *Alphonso* and *Dasheri*, and the canned product generally has a very good flavour and texture so that certain brands produced by established canners have acquired a good reputation as regards quality and can command premium prices with buyers in this country. Currently, Indian canned mangoes are fetching around 100s per case (24×A2½) c.i.f. The fruit is normally packed for export in three can sizes A2½ (30 oz.), A2 (20 oz.) and A1 (12 oz.) and it has been estimated that exports to the United Kingdom probably amount to about 5,000 cases of all can sizes a year. However, the crop failure of the mango in the last two seasons has caused a temporary shortage of supplies, particularly of the large A2½ can size. This size of can is very popular and is sold mainly to the catering trade for use in Indian and Chinese restaurants. There are indications that the demand for canned mangoes by the catering trade is increasing but development of the trade would seem to be handicapped by the difficulty that many processors experience in producing a satisfactory A2½ pack. There is a tendency for many dessert varieties of mangoes to disintegrate when canned, particularly when fruit that is fully ripe is used and obviously the longer processing time required for A2½ cans accentuates any tendency of the fruit to disintegrate. Good quality Indian canned mangoes generally have a much better texture than the products from other countries since most of the canners only process the cheeks and use the fibrous tissues around the stone for the production of mango squash or pulp for local sale.

Production of canned mangoes in the Republic of South Africa probably amounts to about 20,000 standard cases a year and annual exports to the United Kingdom are normally around 15,000 standard cases.

However, production is liable to fluctuate not only according to the mango crop, but also according to the tonnage of pears available for canning. The pear crop is harvested at the same time as the mangoes and canneries give priority to processing the latter fruit since there is far greater demand for canned pears than for canned mangoes. The Peach mango is the chief variety canned in the Republic of South Africa and this is a small fruit which is inclined to be fibrous and rather deficient in flavour, unless it is processed when fully mature. Slices form the major proportion of the South African production and most of the fruit is packed in AIT (16 oz.) size cans. For sometime, South African canned mango slices have been fetching approximately 16/6 per dozen AIT cans ex-wharf, but a crop failure in the Transvaal has caused a shortage of fruit for processing and the new season pack has been offered recently at 19 per dozen AIT cans ex-wharf, London.

The canning of mangoes in Tanzania has been developed during the past decade. For several years, the fruit was processed by Tanganyika Packers Ltd., as a subsidiary activity to meat canning, and in addition there are at least two other canneries processing the fruit. However, reports suggest that in recent years production at the Tanganyika Packers cannery has ceased, in fact production at this cannery would appear to have reached its peak in 1959 when some 9,000 cases (24×AIT) were processed. Since in 1960, the latest year for which figures are available, the output of the cannery had dropped to approximately 5,000 cases (24×AIT). However, according to a recent report, production of canned mango products, including juice and pulp, at another cannery in Tanzania is increasing and in 1964 was estimated to have amounted to 1,100,000 cans of all sizes, i.e., approximately 45,000 cases. Unfortunately, exports of canned mangoes from Tanzania are not shown as a separate item in the

Trade Returns but are included in the item 'Preserved fruits, whole or in pieces, with or without added sugar, whether in airtight containers or not, excluding pineapples'. If it is assumed that this item consists largely of canned mangoes, then total exports from Tanzania are probably of the order of 10,000 standard cases a year and are consigned mainly to the United Kingdom, Aden, Bahrein, and the United States. The United Kingdom provides the chief market and recently annual exports would appear to have averaged around 3,000 standard cases. It is understood that the 'Boribo' mango is one of the varieties processed in Tanzania and this fruit gives a pack of good average quality although not quite comparable as regards texture and flavour with the majority of Indian packs. Currently, Tanzania canned mangoes fetch about the same prices as the South African pack on the London market.

Occasional consignments of canned mangoes are received from Jamaica on the United Kingdom market, but the quality of the packs varies, according to the quantities and dessert varieties of fruit available for processing. There is also some small production of canned mangoes in Dominica, mainly the 'Julie' variety. Exports in 1962 (the latest figure available) were reported to have amounted to just over 1,000 cases and were consigned mainly to the United Kingdom.

Outlets for Canned Mangoes in the United Kingdom

The demand for Indian canned mangoes in the United Kingdom is confined mainly to the limited number of professional Indians earning relatively high salaries who reside in this country and to the numerous Indian and Chinese restaurants which have recently become established in increasing numbers in the large cities. The main outlet is in fact for A2½ size cans for the catering trade and sales at the retail level are limited partly

because of the high retail price, for example, currently a 12 oz. can retails at around 3s and an A2½ (30 oz.) can at 6s, compared with between 2/9 and 3/3 for an A2½ can of peaches or pears. The South African and Tanzanian canned mangoes are available for sale in large self-service stores in most cities and large towns and in many shops specialising in stocking foodstuffs for the immigrant population. The chief demand for this canned fruit is from the West Indians, Pakistanis, and Africans, and certain Indians, at present living in the United Kingdom, although one large firm of multiple grocers reported that in the greater London area at least, sales to British housewives are increasing as the fruit becomes better known. Some members of the trade consider that demand for canned mangoes could be increased considerably if the fruit was advertised and became more widely known and if packs could be sold at prices comparable to those ruling for the established canned fruits such as peaches and pears. Currently, South African canned mangoes are selling around 2/6 per can retail and the 16 oz. can is the most popular size. However, the lack of continuity of supplies of canned mangoes makes advertising the sales promotion difficult, often supplies are almost non-existent for at least six months of the year. Moreover, sometimes the quality of certain South and East African packs is variable and the slices are on occasions fibrous and deficient in flavour.

Markets other than the United Kingdom

Apart from the United Kingdom, the demand for canned mangoes in syrup is limited, there is a small market in Middle Eastern countries, but on the Continent sales are limited to a few shops specialising in the sale of unusual foodstuffs and it has been estimated that the total demand from France, the Federal German Republic, the Netherlands and Belgium is less than 1,000 standard cases a year. The demand

for canned mangoes in the United States is also very limited, locally produced frozen mango slices and pulp being also available to compete for the very limited market, in addition to supplies from Hawaii.

Other Mango Products

International trade in mango products such as juice, canned pulp, nectar and dried mango powder is extremely small. As far as the United Kingdom market is concerned, very limited sales of canned mango juice, nectar and pulp are made chiefly in shops specialising in stocking exotic food-stuffs. Small quantities of Indian canned

mango pulp are sold at approximately 3s 6d per 12 oz. can retail to the immigrant population, and in addition, small quantities of bottled mango juice and squash are also imported for this trade, but the demand is very limited. Attempts to develop outlets for mango pulp and mango powder as a flavouring for use in the ice-cream and baking industries have hitherto met with very little success, since it is generally considered that both these products are rather deficient in flavour. The lack of flavour is particularly noticeable in the case of mango pulp processed in A10 cans (109 oz.) and pulp in this size of container is also often discoloured due to over-cooking.

Book Review

'*Water in Foods*': by SAMUEL A. MATZ, PUBLISHED by *The AVI Publishing Company, Inc., Westport, Connecticut, U.S.A.*, 1965, p. ix+275.

Water is one of man's most valuable assets. It is vital to man as a necessity of life and as an important material required by industry. As an ingredient, its quantity and quality affect the texture, flavour and shelf-life of foodstuffs. Water assumes special significance in the beverage industry as it forms a major portion of the product. The quality of water is thus a major concern of the food processor and food technologist.

The text of the book under review is divided into 18 chapters. The first four chapters deal with the properties of pure water, natural water supplies, quality control tests and standards for drinking water respectively. Chapter 5 deals fairly comprehensively with various methods of water treatment. Disinfection of water forms subject matter of Chapter 6. Recovery of water from effluent and sewage, which becomes a necessity under certain circumstances, is dealt with in Chapter 7. Techniques that have been developed for production of potable water from saline sources are covered in Chapter 8. Discussion on various methods for the determination of moisture content of food forms Chapter 9. Measurement and control of humidity is briefly discussed in Chapter 10. Information in Chapter 11 dealing with water distribution system is of interest to the food engineers. Water absorption and

transport in plant tissues is covered in Chapter 12.

Minor constituents of water, depending on their nature, can profoundly affect the texture, flavour and appearance of certain foods and this subject has been dealt with in Chapter 13. Behaviour of ingredient water in frozen foods, as discussed in Chapter 14, makes an interesting reading.

Transfer of water during dehydration and modern dehydration techniques are covered in Chapter 15. The role played by water in texture of various foods is discussed in Chapter 16. Texture in foods has assumed great importance in food technology in recent years. Packaging materials and their effectiveness as water vapour barrier are discussed in Chapter 17. Microbial spoilage of foods as a function of water activity is discussed in Chapter 18. An 8-page glossary of terms used in water engineering and technology is given at the end. Each chapter contains some tabulated data and bibliography of important technical and research papers.

The author has successfully attempted to cover several interrelated aspects of water in its relation to food. This obviously did not permit him to treat the subject matter in any intensive manner. All the same, the reader will find the book useful and will be inspired to refer to specialised books which deal with individual aspects more intensively. This book is a useful addition to the library of a food technologist.

D. S. BHATIA
The Coca-Cola Corporation
New Delhi

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NOTES and NEWS

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Indian Institute of Foreign Trade, New Delhi

The Second Annual General Meeting of the Institute was held on September 19, 1966, in Vigyan Bhawan, New Delhi. The Chairman, Dr V. K. R. V. Rao, Member, Planning Commission, reviewed the activities and programmes of the Institute.

The Institute was established in the year 1964. During its second year of operation (1965-66), the Institute expanded and developed its programmes and activities. It has increasingly developed the expertise and capacity as a professional organisation to undertake various types of training programmes, research activities and marketing research assignments.

Training and General Research

Two courses on the techniques of International Marketing were organised for the senior executives. A special ten-day programme for the training of executives drawn from small and medium firms has been

developed. Two courses were organised one at Delhi and the other at Agra.

A ten-month Diploma course in Foreign Trade has been developed.

Training abroad

Under the Bilateral Indo-French Technical Assistance, a 7-month training was sponsored.

Two officers of the Institute were sent under the auspices of Ford Foundation to the International Marketing Institute Programme in Harvard University of the United States for special training for seven months.

The Institute has drawn a comprehensive programme for conducting research into problems of foreign trade.

Marketing Research

The Marketing Research division of the Institute organised four major types of activities.

1. Overseas market surveys,
2. Area surveys,
3. Commodity studies, and
4. Seminars.

Seven commodity studies were conducted including one on 'Preserved Fruits and Vegetables'. Seven seminars were held including 'Packaging for Export' at New Delhi and 'Exports of Processed foods' at Bangalore. Synchronising with the Seminar on 'Packaging for Exports', an Exhibition on 'Export Packaging' was organised by the Indian Council of Trade Fairs and Exhibitions in collaboration with the Institute. This exhibition was initially organised at Delhi, whereafter it was taken to Bombay, Calcutta, and Madras.

On the recommendations of the Institute, the Institute of Packaging has been established in Bombay.

The Institute has brought out 18 seminar reports, 10 commodity study reports and

four other publications. A quarterly journal 'Foreign Trade Review' has been started.

Sugar Production in Co-operative Factories

Co-operative factories in India produced nine lakh tonnes of sugar during the crushing season ended August, 1966.

This is 26 per cent of the country's total sugar production (34.72 lakh tonnes) during the period.

The co-operative sugar factories also accounted for nearly 40 per cent of the country's total production of raw sugar during 1965-66.

There are at present 76 co-operative sugar factories in the country. Out of these, 52 were in production in the 1965-66 crushing season. The rest are in various stages of installation and development. The total licensed capacity of sugar factories in the co-operative sector accounts for 14.40 lakh tonnes, which represents nearly 27 per cent of the country's total licensed capacity in the industry as a whole.

The co-operative sugar factories are mainly owned by cane growers. The total membership of the 57 co-operative sugar factories is 2.70 lakhs, of which 2.47 lakhs are sugar-cane growers.

The share capital of these factories on March 31, 1966, was Rs 26.28 crores. Of this the grower-members' contribution was Rs 14.01 crores and State Governments' contribution Rs 9.88 crores.

During the Fourth Five Year Plan, it is proposed to set up a large number of sugar factories mainly in the co-operative sector. Of these, 18 have already been licensed. The total licensed capacity in the co-operative sector at the end of the Fourth Plan will be nearly 37 per cent of the total capacity of the industry as a whole.

The Draft Fourth Five Year Plan provides for Rs 10 crores for assisting schemes relating to co-operative sugar factories.

Members of Tariff Commission Review Committee

Chairman

Dr V. K. R. V. Rao, Member, Planning Commission, New Delhi.

Members

Shri M. P. Pai, Chairman, Tariff Commission, Bombay.

Dr D. K. Rangnekar, Special Representative, Economic Times, New Delhi.

Dr D. T. Lakdawala, Department of Economics, University of Bombay, Bombay.

Shri H. N. Ray, Additional Secretary, Ministry of Finance, New Delhi.

Dr K. S. Krishnaswamy, Economic Adviser, Planning Commission, New Delhi.

Shri S. Venkatesan, Officer on Special Duty, Ministry of Commerce, New Delhi.

Dr P. V. Gunishastri, Secretary, Tariff Commission, Bombay.

Himachal Pradesh—Palampur Agricultural Research Centre

The Palampur campus of the Ludhiana Agricultural University which will now be Himachal wing of the University is proposed to be developed into a nucleus of agricultural research, teaching and extension for Himachal Pradesh.

The Palampur campus was established by the Agricultural University during the current year and is located on a strip of land measuring 50 acres. It is proposed to acquire another 100 acres for laying out college buildings and play-grounds.

The chain of hill research stations, which have already shown good performance, will help the Palampur campus to building up the proposed nucleus of research, teaching and extension work during the Fourth Plan period.

One of the important research stations of the University at Nagrota (Kangra) which helped make history by establishing Italian honey bees in India, is now launching on plans for introducing these foreign honey bees in sub-mountainous areas. The successful experiments conducted at this station have revealed a big potential for increasing the production of honey.

The University research stations at Keylong and Kandaghat have already won prominence by developing high-yielding wheat and fruit varieties, respectively. The maize research centre at Rajaora has succeeded in evolving some promising local varieties of hybrid maize.

International Symposium on Protein Foods and Concentrates

The Symposium will be held at the Central Food Technological Research Institute, Mysore (India), from June 27 to July 4, 1967. The Symposium has been sponsored by the Council of Scientific and Industrial Research, New Delhi, in co-operation with the National Institutes of Health, U.S.A., and the Association of Food Technologists, India. International agencies like FAO, WHO and UNICEF are being invited to participate in it as co-sponsors.

In the context of the wide prevalence of malnutrition in developing countries due largely to protein deficiencies in the diets of the people, the Symposium should prove a very valuable forum for exchange of information on latest trends in the science and technology of protein foods. Emphasis will be on processing, consumer acceptance and marketing of protein foods in the newly developing countries with special reference to South and Southeast Asia.

The Central Food Technological Research Institute—the venue of the Symposium—has done pioneering work over the last decade in the development of protein concentrates and isolates from vegetable raw materials.

The Symposium will have seven technical sessions, namely, general aspects of protein foods; economic aspects (resources); public health and clinical aspects; amino acid production and supplementation; toxicology; protein concentrates and isolates; consumer acceptability and marketing.

Among the main features are invited papers from specialists and discussant papers on each focal topic, besides special lectures on subjects of interest.

Invitation to participate in the Symposium is extended to specialists from research organizations and industries in India and abroad specialising in science and technology of protein foods.

The last date for receipt of abstracts of papers (in duplicate) is March 31, 1967 and full papers (in duplicate) is May 1, 1967.

Those interested can obtain further information by writing to: Dr B. L. Amla or Dr T. N. R. Rao, Secretaries, International Protein Symposium, Central Food Technological Research Institute, Mysore 2, India.

Training Course in Fruit and Vegetable Preservation

The Small Industries Service Institute, Government of India (Ministry of Industry), Jaipur, Rajasthan, has commenced training course of 3 months duration in Fruit and Vegetable Preservation at Jaipur, with effect from 27th December, 1966.

The following candidates have been admitted to the aforesaid course.

1. Shri Sitaram, M/s Chunni Dawakhana, Johri Bazaar, Jaipur.
2. Shri Ram Babu Dasud, M/s Ram Sarandas Damodardas, Tripolia Bazaar, Jaipur.
3. Shri Ram Nagina Mishra, M/s Adarsh Chemical Works, Adarsh Nagar, Jaipur.
4. Shri Gangaram, M/s Phoolchand Gangaram, Chotti Chopad, Jaipur.

5. Shri Birdhi Chand, M/s Kwaliti Ice Cream, M.I. Road, Jaipur.
6. Shri Om Prakash Tapria, M/s Tapria Medical Hall, Jodhpur.
7. Shri Ramesh Raniwala, M/s Mahalaxmi Cold Stores, Dal Mandi, Kota.
8. Shri S. B. Kabra, M/s Jay Canning Co., Sadar, Sudh Sadan, Kota.
9. Shri Mahesh Chand Jain, M/s Ramdutta Mal Lachhman Das, Sarafa Bazaar, Alwar.
10. Shri Manohar Lal, Village Garhi Sarai, Momdar Khan, P.O. Ghohana, Dist., Rohtak (Haryana).

Mr C. Subramaniam, Union Minister for Food, visits C.F.T.R.I.

Mysore, December 20, 1966: The Union Minister for Food, Agriculture, Community Development and Co-operation, Mr C. Subramaniam, accompanied by Mr G. Narain Gowda, State Minister for Agriculture, Mysore, visited the Central Food Technological Research Institute, Mysore, to-day.

The Union Minister was shown round the Institute by the Director, Dr H. A. B. Parpia.

Mr Subramaniam evinced keen interest in the high-protein foods being developed at the Institute such as *Bal Ahar*, Infant Food, Weaning food, Lac-tone, Indian Multi-purpose Food, etc., and also in the work on problems relating to the conservation of food resources.

The Minister saw the meat, fish and poultry products developed by the Institute and a demonstration of coating of shell eggs for improving the storage quality of eggs. He also witnessed the pilot plant production of products like egg powder, lac-tone, cardamom oil, etc.

He evinced considerable interest in the work on rice and rice products and was glad to know that the Institute's processes for parboiling and quick-ageing of rice are being

commercially used by many rice mills in the country.

Mr Subramaniam's address

Later, addressing the staff of the Central Food Technological Research Institute, Mr C. Subramaniam declared that our country cannot survive as an independent nation unless we become self-sufficient and are in a position to feed our teeming millions.

Two important aspects with regard to our food problem, he said, are, first, growing more food, and secondly, making the best use of what we produce. Our production is at a very low level compared to other countries. We are not only bad producers but also bad processors. We waste a great deal of food from the time of its production, through various stages of storage, processing and handling and cooking. Our backwardness in these respects are responsible for our present food problem. In the efforts to break away from this backwardness and save the losses during processing, storage and handling of food materials, the Central Food Technological Research Institute is playing an important role yet much more needs to be done.

He wanted proper opportunities and facilities for scientists and technologists. A congenial scientific atmosphere had to be created for the scientists to work efficiently and effectively. He thought the present system of administrative set up stood in the way of efficient functioning of scientists. He made a plea that at least in scientific institutions we must break away from the traditional system of administration. Our first priority should be to revitalise the functioning of our scientific institutions so that they play their rightful role.

He also referred to brain-drain among scientists and said this was largely due to inadequate facilities and lack of proper atmosphere in the country for the pursuit of research. He wanted a new system to be evolved not only to attract talented and



Improved Packaging Techniques for perishables being explained to him

eminent Indian scientists to return from abroad but also to provide them with adequate facilities, congenial atmosphere and a decent income.

He declared that unless scientists' come to the forefront and play a vital role and are given all facilities and encouragement, we may not be able to make any headway in our economic and industrial development.

Earlier, Dr H. A. B. Parpia, Director of the Institute, welcoming the Minister assured him the fullest co-operation of the Institute in tackling the country's food problem. He also explained in brief the work

of the Institute, the number of research projects under investigation and the number of processes and products that are ready for commercial exploitation.

Dr Parpia said the work of C.F.T.R.I. has been given a project orientation to solve the major national food problems within a targeted period of time and that each project has been entrusted to a project leader who along with his team of scientists are responsible for the implementation of the project. This has given considerable freedom and initiative to the scientists and has already started producing good results.

- *Study Report on Preserved Fruits and Vegetables Industry—I.I.F.T., New Delhi*
- *Contracts placed by the Chief Director of Purchase, Ministry of Food and Agriculture (Government of India), New Delhi*

Study Report on Preserved Fruits and Vegetables Industry—I.I.F.T., New Delhi

A comprehensive study of the preserved fruits and vegetables industry was undertaken by the Indian Institute of Foreign Trade with a view to examining the problems of production and exports. A sample of 27 units located in Delhi, Bombay, Bangalore, Trichur, Madras, Calcutta and Allahabad representing different sections of the industry was chosen for the purpose of the survey. The units chosen were interviewed with the aid of a suitably designed questionnaire. A summary of recommendations made in the report is given below:

1. Formation of growers' co-operatives for closer understanding between growers and processors.

2. Exempting fruit and vegetable orchards from the Land Ceiling Act in the interests of economic cultivation. It may be mentioned that the minimum economic holding of an orchard is said to be 50 acres.

3. Development of special varieties of fruits and vegetables suitable for processing by research effort through the Central Food Technological Research Institute, the Indian Council of Agricultural Research and Horticultural Departments of the State Governments in close collaboration with growers and processors.

4. The Directorate of Marketing and Inspection should expand its activities in the field of grading fresh fruits and vegetables.

5. The Directorate of Marketing and Inspection should take steps for setting up packing houses in important centres

of horticultural production, where the fresh produce can be properly graded and packed.

6. The Government should take steps to provide adequate facilities for cold storage of fresh fruits and vegetables. The Directorate of Marketing and Inspection should undertake a survey to assess the cold storage requirements in different horticultural centres.

7. The Government should introduce refrigerated railway wagons with shelves for transportation of fresh fruits and vegetables.

8. While fresh fruits are allowed to be transported by rail at quarter parcel rate, fresh vegetables are charged at half parcel rate. It is recommended that the Government should extend the concession of quarter parcel rate to fresh vegetables as well.

9. The Government should ensure adequate and regular supply of cans to the industry. Current tinsplate requirements of the industry have been estimated at 6,000 tonnes a year.

10. There are certain anomalies in the allotment of tinsplate quotas by the Chief Director of Purchase: e.g., tinsplate is allotted for pineapple slices, but not for pineapple juice which is a concomitant product of the processing. Such anomalies should be removed.

11. Government should encourage the setting up of modern bottle-making units in the South.

12. Government should take active steps for the development of the corrugated board industry in India, which will have an important bearing on exports in many other fields as well.

13. It is recommended that the Government should take suitable steps to ensure adequate and regular supplies of sugar manufactured by the carbonisation process to the units situated in the South.

14. Requirements of pectin, citric acid, flavouring materials etc., which are to be imported, have been estimated at Rs 1.3

million at the current level of production. It is recommended that an entitlement of 15 per cent should be allowed on exports of preserved fruit and vegetable products other than pickles and chutneys to cover imports of these chemicals.

15. There is an urgent need for the import of certain precision equipment like vacuum sealers and automatic filling machines which would help reduce the cost of production considerably. Total requirements of the industry in this respect have been estimated at Rs 9.45 million in foreign exchange. It is recommended that the Government should make this amount available to the industry, which could be released at the rate of Rs 3.15 million a year during the next three years. This amount could be allotted through the Processed Foods Export Promotion Council to individual units on the basis of their export performance and potential.

16. The present labour laws, as applicable to this industry, do not allow women to work after sunset. It is recommended that the Government should consider removal of this restriction, as in the case of fish canning industry, which inhibits effective utilisation of capacity.

17. It is suggested that the Processed Foods Export Promotion Council should constitute a study team to investigate the feasibility of organising the collection of waste material of the industry at suitable centres in the country, and recommend steps to be taken for effective utilisation of such material.

18. It is urged that an immediate ban should be imposed on the export of raw mango slices in brine in the interest of exports of pickles and chutneys which yield higher unit values.

19. The 10 per cent import entitlement, operative till the recent devaluation, covered the industry's requirements of chemicals like pectin and citric acid, and allowed a small margin for imports of machinery, spares and equipment. It is recommended that the import entitlement scheme should be revived so as to preserve the essential link

between imports of these chemicals and exports of the industry. It is suggested that in reviving the scheme, pickles and chutneys may be excluded from its purview, as the use of such chemicals in their manufacture is negligible. The rate of entitlement should be 15 per cent so that the industry's requirements of chemicals are covered adequately.

20. Consequent on the withdrawal of the cash subsidy scheme in the wake of devaluation, it would be barely possible to offer the sugar-based products at the pre-devaluation level of prices (in foreign exchange). Apart from the fact that a certain price reduction will be forced on the exporter as a result of devaluation, it is essential to effect at least a 25 per cent reduction in the prices of our sugar-based products which are out-priced in world markets by a wide margin. It is, therefore, recommended that cash subsidy of at least 20 per cent should be allowed on our exports of sugar-based fruit and vegetable products. Here again, chutneys may be excluded from the range of such products, as the competitive position in respect of chutneys is relatively strong on the one hand, and the elasticity of demand considerably low on the other, as compared to other sugar-based products.

21. Available information on overseas demand and competition is very meagre. It is, therefore, suggested that market surveys should be conducted initially in selected West European markets, particularly with a view to ascertaining the possibility of introducing certain typically Indian products such as canned *bhendi* (lady-fingers), *parwal*, *tinda* and spinach.

22. There is considerable need for publicising abroad our preserved fruit and vegetable products. As the individual exporters generally lack adequate financial resources for this purpose, it is suggested that the Processed Foods Export Promotion Council should undertake a publicity drive in selected overseas markets, for projecting the image of our products effectively.

Contracts Placed by the Chief Director of Purchase, Ministry of Food and Agriculture (Government of India), New Delhi.

The following statement contains particulars of orders placed by the Chief Director of Purchase, Ministry of Food and Agriculture, Department of Food (Army Purchase Organisation), Government of India, New Delhi, during week ending 17th September, 1966 (Orders of less than Rs 5,000 in value are not included).

Sl. No.	Tender No. and Article	Qty. (tonnes)	Value (Rs)	Name of contractor	Indigenous or Imported	Terms of Delivery (F.O.R.)
1	5/1/21/66-Pur-VI dt. 19-8-66 Pears Tinned	10-000	34,600	M/s. Spencer & Co. Ltd., Delhi	Indigenous	Kanpur
2	5/1/20/66-Pur-VI dt. 22-8-66 Pears Tinned	5-000	16,250			
3	5/1/20/66-Pur-VI dt. 22-8-66 Guava Tinned	13-750	36,987	M/s. Midland F. & V. Products (I), Pvt. Ltd., New Delhi	"	Okhla
4	5/1/21/66-Pur-VI dt. 19-8-66 Pears Tinned	25-000	85,750			
5	5/1/20/66-Pur-VI dt. 20-8-66 Pears Tinned	60-000	2,11,800	M/s. H. A. Rahim & Co., Rajbagh, Srinagar (Kashmir)	"	Ex-factory godown
6	5/1/20/66-Pur-VI dt. 18-8-66 Tinned Papaya	5-000	16,250	M/s. Nagpur Orange Growers' Coop. Assn. Ltd., Processing Unit, Nagpur	"	Nagpur
7	5/1/20/66-Pur-VI dt. 22-8-66 Papaya Tinned	2-000	5,820	M/s. Rai & Sons Pvt. Ltd., Middle Circle, New Delhi	"	Hyderabad
8	5/1/20/66-Pur-VI dt. 22-8-66 Guava Tinned	11-250	30,262	M/s. New Swadeshi Sugar Mills Ltd., Prop. Allahabad Canning Co., P.O. Bamrauli, Allahabad	"	Bamrauli
9	5/2/27/66-Pur-VI dt. 18-8-66 Tinda in Brine	13-750	19,210	M/s. Midland F. & V. Products (I) Pvt. Ltd., New Delhi	"	Mathura
10	5/2/27/66-Pur-VI dt. 18-8-66 Tinda in Brine	6-250	9,188	M/s. The New Swadeshi Sugar Mills Ltd. Allahabad	"	Bamrauli
11	5/2/27/66-Pur-VI dt. 18-8-66 Tomatoes Canned	5-000	15,000	M/s. Rai & Sons Pvt. Ltd., New Delhi	"	Hyderabad
12	5/2/27/66-Pur-VI dt. 13-8-66 Tomatoes Canned	15-000	44,850	M/s. The Nagpur Orange Growers' Coop. Assn. Ltd., Processing Unit, Nagpur	"	Nagpur
13	5/2/7/66-Pur-VI dt. 13-8-66 Parwal in Brine	5-000	8,100	M/s. R. N. Rustomji & Co., Bombay	"	Wadi Bunder
14	5/3/15/66-Pur-VI dt. 9-8-66 Orange Marmalade	6-585	16,001	M/s. The Midland F. & V. Products (I) Pvt. Ltd., New Delhi	"	Mathura
15	5/2/28/66-Pur-VI dt. 29-8-66 Peas in Brine	9-438	20,858	M/s. The New Swadeshi Sugar Mills Ltd., Bamrauli	"	Bamrauli

Sl. No.	Tender No. and Article	Qty. (tonnes)	Value (Rs)	Name of contractor	Indi- genous or Imported	Terms of Delivery (F.O.R.)
16	5/4/17/66-Pur-VI dt. 12-9-66 Potatoes tinned	50-000	81,500	M/s. Dyer Meakin Breweries Ltd., Ghaziabad	Indi- genous	Sahibabad
17	„ „ „ „	77-000	130,130	M/s. The Midland F. & V. Products (I) Pvt. Ltd., New Delhi	„	Mathura
18	5/4/17/66-Pur-VI dt. 2-9-66 Potatoes tinned	25-000	42,250	M/s. Tims Products Ltd., Belgharia	„	Belgharia
19	5/4/17/66-Pur-VI dt. 8-9-66 Potatoes tinned	20-000	32,800	M/s. The Mysore Fruit Products Ltd., Bangalore	„	Bangalore
20	5/4/17/66-Pur-VI dt. 12-9-66 Potatoes tinned	19-000	32,100	M/s. Rai & Sons Pvt. Ltd., New Delhi	„	Hyderabad
21	5/4/17/66-Pur-VI dt. 2-9-66 Tinned Potatoes	19-000	32,100	M/s. Tims Products Ltd., Belgharia	„	Belgharia
22	5/4/17/66 Pur-VI dt. 12-9-66 Tinned Potatoes	50-000	79,500	M/s. Dyer Meakin Breweries Ltd., Ghaziabad	„	Sahibabad
23	„ „ „ „	20-000	33,800	M/s. The Midland F. & V. Products (I) Pvt. Ltd., New Delhi	„	Mathura
1	5/2/32/66-Pur-VI dt. 2-11-66 Tinda in brine	5-000	8,262	M/s. Dyer Meakin Breweries Ltd., Ghaziabad	„	Sahibabad
2	5/2/32/66-Pur-VI dt. 2-11-66 Kundri in brine	9-582	15,810	M/s. Rai & Sons Pvt. Ltd., New Delhi	„	Hyderabad
3	5/3/17/66-Pur-VI dt. 27-10-66 Pineapple Jam	5-000	13,450	M/s. Midland Fruit and Vegetable Products (I), New Delhi	„	Mathura
4	5/3/17/66-Pur-VI dt. 27-10-66 Mango Jam	5-000	12,950	M/s. Dyer Meakin Breweries Ltd., Ghaziabad	„	Sahibabad
5	5/3/18/66-Pur-VI dt. 29-10-66 Mango Jam	2-500	6,975	M/s. Midland Fruit and Vegetable Products (I), New Delhi	„	Mathura
6	5/3/18/66-Pur-VI dt. 29-10-66 Mango Jam	2-500	6,975	M/s. Nagpur Orange Growers' Co-opera- tive Association Ltd., Nagpur	„	Nagpur
7	5/7/8/66-Pur-VI dt. 27-10-66 Carrots Dehyd	3-000	33,300	M/s. Miki Food Products, Meerut	„	Meerut
8	5/7/9/66-Pur-VI dt. 29-10-66 Carrots Dehyd	7-000	79,500	M/s. Midland Fruit and Vegetable Products (I), New Delhi	„	Mathura
9	5/7/7/66-Pur-VI dt. 26-10-66 Cabbage Dehyd	1-000	10,390	„	„	„
10	5/7/7/66-Pur-VI dt. 26-10-66 Carrot Dehyd	10-000	113,000	„	„	„
11	5/7/7/66-Pur-VI dt. 24-10-66 Cabbage Dehyd	1-000	10,310	„	„	„
12	5/7/7/66-Pur-VI dt. 28-10-66 Okra Dehyd	25-000	315,000	„	„	„
13	5/1/25/66-Pur-VI dt. 29-10-66 Guava Tinned	49-497	128,197	„	„	„
14	5/3/16/66-Pur-VI dt. 29-10-66 Pineapple Jam	15-000	43,350	„	„	„

Sl. No.	Tender No. and Article	Qty. (tonnes)	Value (Rs)	Name of contractor	Indigenous or Imported	Terms of Delivery (F.O.R.)
15	5/3/16/66-Pur-VI dt. 29-10-66 Orange Marmalade	5-000	13,750	M/s. Midland F. & V. Products (I), New Delhi	Indigenous	Mathura
16	5/3/16/66-Pur-VI dt. 29-10-66 Guava jelly	8-250	22,522	"	"	"
17	5/2/31/66-Pur-VI dt. 26-10-66 Baked Beans in Tomato Sauce	15-000	32,850	M/s. Midland Fruit & V. Products (I), New Delhi	"	"
18	5/7/7/66-Pur-VI dt. 26-10-66 Peas Dehyd	10-000	100,000	M/s. Hindustan Lever Ltd., N. Delhi	"	Ghaziabad
19	5/7/7/66-Pur-VI dt. 24-10-66 Peas Dehyd	3-280	32,800	"	"	"
20	5/7/8/66-Pur-VI dt. 28-10-66 Peas Dehyd	7-000	70,000	"	"	"
21	5/1/25/66-Pur-VI dt. 29-10-66 Guava Tinned	45-000	116,550	M/s. New Swadeshi Sugar Mills Ltd., Allahabad	"	Bamrauli
22	5/3/16/66-Pur-VI dt. 29-10-66 Guava jelly	6-750	18,427	"	"	"
23	5/2/31/66-Pur-VI dt. 26-10-66 Baked Beans in Tomato Sauce	5-000	10,950	"	"	"
24	5/2/31/66-Pur-VI dt. 26-10-66 Cauliflower	1-000	49,140	"	"	"
25	5/4/22/66-Pur-VI dt. 27-10-66 Potatoes	50-000	84,500	M/s. Dyer Meakin Breweries Ltd., Ghaziabad	"	Sahibabad
26	5/4/22/66-Pur-VI dt. 27-10-66 Potatoes	10-000	17,000	M/s. Rai & Sons Pvt. Ltd. New Delhi	"	Hyderabad
27	5/4/22/66-Pur-VI dt. 21-10-66 Potatoes	40-000	67,600	M/s. Mysore Fruit Products, Bangalore	"	Bangalore
28	5/2/30/66-Pur-VI dt. 23-9-66 Tomato Canned	60-000	171,000	M/s. Nagpur Orange Growers' Co-op. Assn. Ltd., Nagpur	"	Nagpur
29	5/2/30/66-Pur-VI dt. 23-9-66 Baked Beans in tomato sauce	15-000	29,850	M/s. Midland Fruit & V. Products (I), New Delhi	"	Mathura
30	5/2/30/66-Pur-VI dt. 19-9-66 Baked Beans in tomato sauce	5-000	9,950	M/s. Tims Products Ltd., Belgharia	"	Belgharia
31	5/2/30/66-Pur-VI dt. 28-9-66 Cauliflower in Brine	5-000	14,000	M/s. Rai & Sons Pvt. Ltd., New Delhi	"	Hyderabad
32	5/2/30/66-Pur-VI dt. 28-9-66 Cauliflower in Brine	35-000	103,250	M/s. Midland F. & V. Products (I), New Delhi	"	Mathura
33	5/1/22/66-Pur-VI dt. 1-10-66 Pineapple Tinned	22-000	93,500	"	"	"
34	5/1/22/66-Pur-VI dt. 19-9-66 Pineapple Tinned	18-000	76,500	M/s. Tims Products Ltd., Belgharia	"	Belgharia
35	5/1/22/66-Pur-VI dt. 1-10-66 Papaya Tinned	5-000	16,550	M/s. Rai & Sons Pvt. Ltd., New Delhi	"	Hyderabad
36	5/1/22/66-Pur-VI dt. 1-10-66 Guava Tinned	18-000	47,340	M/s. New Swadeshi Sugar Mills Ltd., Bamrauli	"	Bamrauli
37	5/1/22/66-Pur-VI dt. 1-10-66 Guava Tinned	22-000	57,860	M/s. Midland F. & V. Products (I), New Delhi	"	Mathura
38	5/6/8/66-Pur-VI dt. 17-10-66 Potatoes Dehyd	3-960	36,828	M/s. Hindustan Lever Ltd., New Delhi	"	Ghaziabad
39	5/1/26/66-Pur-VI dt. 28-10-66 Orange	60-000	210,000	Government of Sikkim, Gangtok	"	Rangpo Out agency

Sl. No.	Tender No. and Article	Qty. (tonnes)	Value (Rs)	Name of contractor	Indi- genous or Imported	Terms of Delivery [F.O.R.]
40	5/1/24/66-Pur-VI dt. 28-10-66 Orange	5-000	17,500	Government of Sikkim, Gangtok	Indi- genous	Rangpo Out agency
41	5/1/24/66-Pur-VI dt. 1-11-66 Guava	17-000	44,211	M/s. New Swadeshi Sugar Mills Ltd., Allahabad	"	Bamrauli
42	5/1/26/66-Pur-VI dt. 2-11-66 Guava	87-000	249,690	"	"	"
43	5/4/26/66-Pur-VI dt. 11-11-66 Potatoes	2-430	3,864	"	"	"
44	5/4/33/66-Pur-VI dt. 15-11-66 Cauliflower	13-000	33,410	"	"	"
45	5/3/19/66-Pur-VI dt. 15-11-66 Guava jelly	6-000	16,020	"	"	"
46	5/2/33/66-Pur-VI dt. 10-11-66 French Beans	45-000	105,300	M/s. Darlco Canning Co., Trichur	"	Trichur
47	5/1/26/66-Pur-VI dt. 2-11-66 Orange	2-000	7,000	M/s. Rai & Sons Pvt. Ltd., New Delhi	"	Hyderabad
48	5/4/24/66-Pur-VI dt. 1-11-66 Potatoes	5-000	7,700	"	"	"
49	5/2/33/66-Pur-VI dt. 15-11-66 Kundri	5-000	8,200	"	"	"
50	5/1/26/66-Pur-VI dt. 28-10-66 Pineapple	10-000	40,000	M/s. Kaycee Planta- tions, Trichur	"	Trichur
51	5/1/26/66-Pur-VI dt. 27-10-66 Orange	10-000	37,000	M/s. Canning Indus- tries Cochin Ltd., Trichur	"	"
52	5/2/33/66-Pur-VI dt. 10-11-66 French Beans	45-000	105,300	"	"	"
53	5/1/26/66-Pur-VI dt. 23-10-66 Guava	25-000	71,250	M/s. Nagpur Orange Growers' Coop. Assn. Ltd., Nagpur	"	Nagpur
54	5/2/33/66-Pur-VI dt. 10-11-66 Peas	15-000	33,000	"	"	"
55	5/1/26/66-Pur-VI dt. 2-11-66 Guava	20-000	49,800	M/s. Spencer & Co. Ltd., Delhi	"	Kanpur
56	5/1/26/66-Pur-VI dt. 2-11-66 Orange	20-000	79,800	M/s. Midland Fruit and Vegetable Pro- ducts, N. Delhi	"	Mathura
57	5/1/26/66-Pur-VI dt. 2-11-66 Pineapple	20-000	90,000	"	"	"
58	5/1/26/66-Pur-VI dt. 2-11-66 Guava	13-000	37,310	"	"	"
59	5/4/23/66-Pur-VI dt. 31-10-66 Potatoes	4-766	7,673	"	"	"
60	5/4/25/66-Pur-VI dt. 2-11-66 Potatoes	5-000	8,050	"	"	"
61	5/2/33/66-Pur-VI dt. 14-11-66 Cauliflower	14-000	35,980	"	"	"
62	5/3/19/66-Pur-VI dt. 14-11-66 Raspberry jam	9-000	24,030	"	"	"
63	5/1/26/66-Pur-VI dt. 31-10-66 Pineapple	70-000	315,000	M/s. Tims Products Ltd., Belgharia	"	Belgharia
64	5/1/26/66-Pur-VI dt. 31-10-66 Guava	10-000	28,700	"	"	"
65	5/2/33/66-Pur-VI dt. 9-11-66 Cauliflower	13-000	33,410	"	"	"
66	5/2/33/66-Pur-VI dt. 1-11-66 Kundri	15-000	24,150	M/s. R. N. Rustomji & Co., Bombay	"	Wadi Bunder

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-

U.S.A.

Dispenser Manufacturer Honoured

In an unprecedented move, two great New York Syrup Associations banded together recently to pay tribute to Mr William H. Jacobs, president of Jet Spray Corp., as on the Nation's foremost innovators in beverage merchandising.

At a ceremony attended by 225 association members in New York, Mr Jacobs was

presented with an illuminated plaque by Mr Bernard Halfond, secretary, who represented the combined group of syrup manufacturers of the Empire City Syrup Association and the Knickerbocker Syrup Association.

Mr Jacobs is credited with almost single-handedly creating the non-carbonated beverage dispenser industry with his company's Jet Spray visual display electrically refrigerated cold drink coolers.

The syrup associations cited him for having 'given a superior meaning to the word "service" by wholehearted effort in a truly tireless manner'; for having 'evidenced unusual inspirational ability and brought commendable benefit to all of the many who have been privileged to work with him' and for having 'rewarded the industry by deeds which in the course of events have resulted in progress beyond the highest expectations of duty'.

It was the first time in the group's 25-year history that this type of honour has ever been bestowed to an individual.

Nobel Prize Awarded to Two Americans

Two American scientists were jointly awarded the Nobel Prize for Medicine for their research on cancer.

They are Dr Peyton Rous, 87, of the Rockefeller University, New York, and Dr Charles B. Huggins, 66, of Chicago University, Chicago, Illinois. Both will share the \$60,000 award.

Dr Rous was the first to show that a virus can cause cancer in animals. That was 50 years ago. The significance of Rous's initial discovery, 'the Nobel Committee noted, has been enhanced with every passing year'.

Dr Huggins discovered 25 years ago the hormonal treatment for prostate cancer in men, and breast cancer in women—two of the most common forms of cancer.

Preserving Food by putting it to sleep

A process has been developed in the United States that puts food to 'sleep' so that it can be stored for long period or transported over long distances without losing its freshness. The process is based on the well-known biological fact that the presence of oxygen causes fruits and vegetables to ripen, rot and decay.

Now a machine purges all but one per cent of the oxygen from the food storage enclosure and pumps into it a carefully controlled atmosphere of inert nitrogen. This, in effect, puts the food to sleep, temporarily stopping or slowing biological processes which lead to deterioration. The equipment can be installed in a truck.

Amid the nitrogen, produce can endure with virtually no deterioration for several days—or even for weeks—on an ocean voyage. Experiments with meat, fish and even flowers were equally impressive.

Its developer said tomatoes or melons, often picked before they are fully ripe, could not be allowed to ripen naturally in the field.

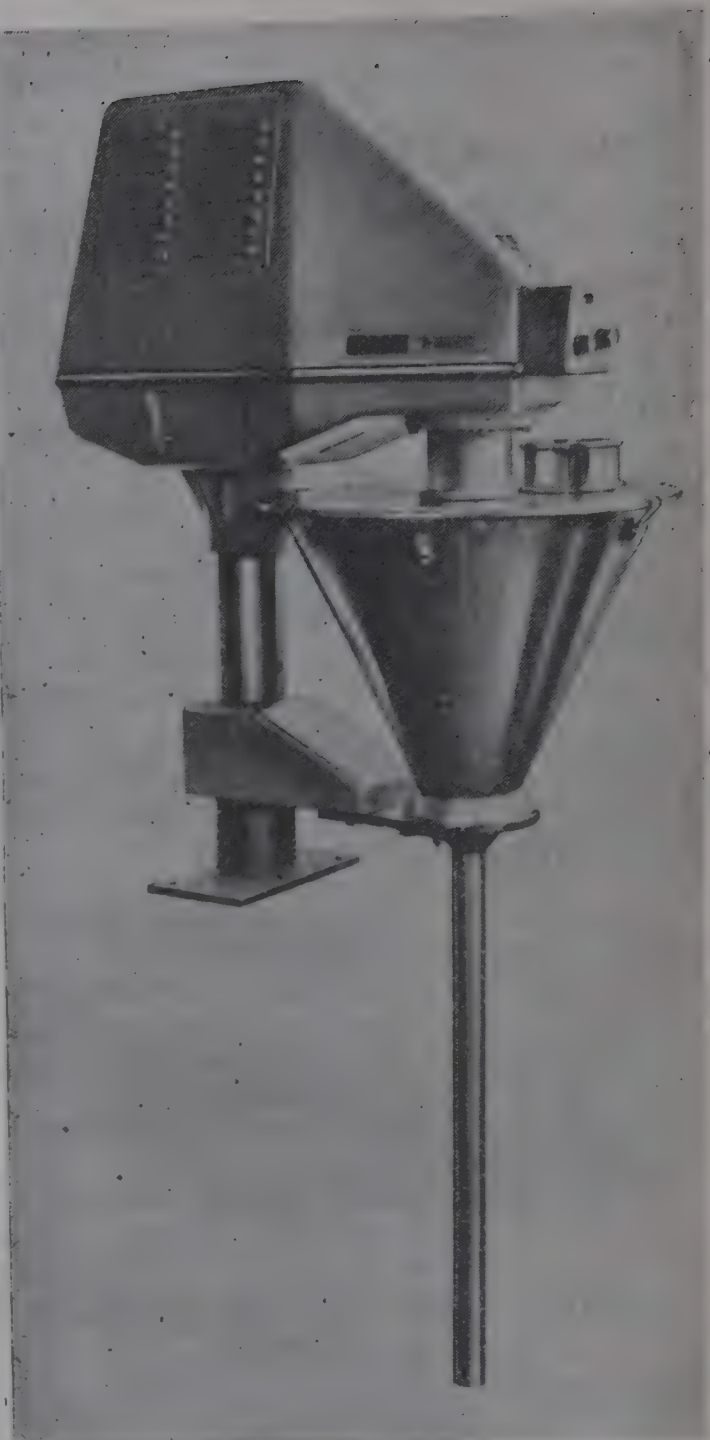
Because it cuts down spoilage loss, the process could reduce prices of out of season produce, and extend distant foreign markets for perishable farm products.

The U.S. Department of Agriculture has called for further development of the process.

U.K.

Powder Filling Machines

Simultaneously with the announcement of their move to a new and modern factory at Hersham, Allen Transmatic Limited announce several new and far reaching models of powder filling machines.



The Allen Transfil Model AT. 2 (p) Volumetric Filling Head fitted with a precision mechanical revolution counter. Infinitely adjustable. Note the extra-long spiral and funnel for use on form, fill and seal machines.

The move into the new factory has been necessitated by the rapid rise in production of machines since the introduction of the first TRANSFIL at last year's PAKEX. The factory will give all-round increases in production, service and showroom facilities.

INDIAN FOOD PACKER

One of the new models announced by Allen Transmatic is their new precision Transfil Model AT. 2 (p). The need for ever-increasing accuracies together with higher speeds in filling has prompted Allen Transmatic to bring out this precision version of their successful 'Transfil' machine. In this model, the driven revs of the auger are positively counted after the clutch mechanism has engaged to give very high and consistent accuracy in stopping and starting and a small degree of mechanical displacement.

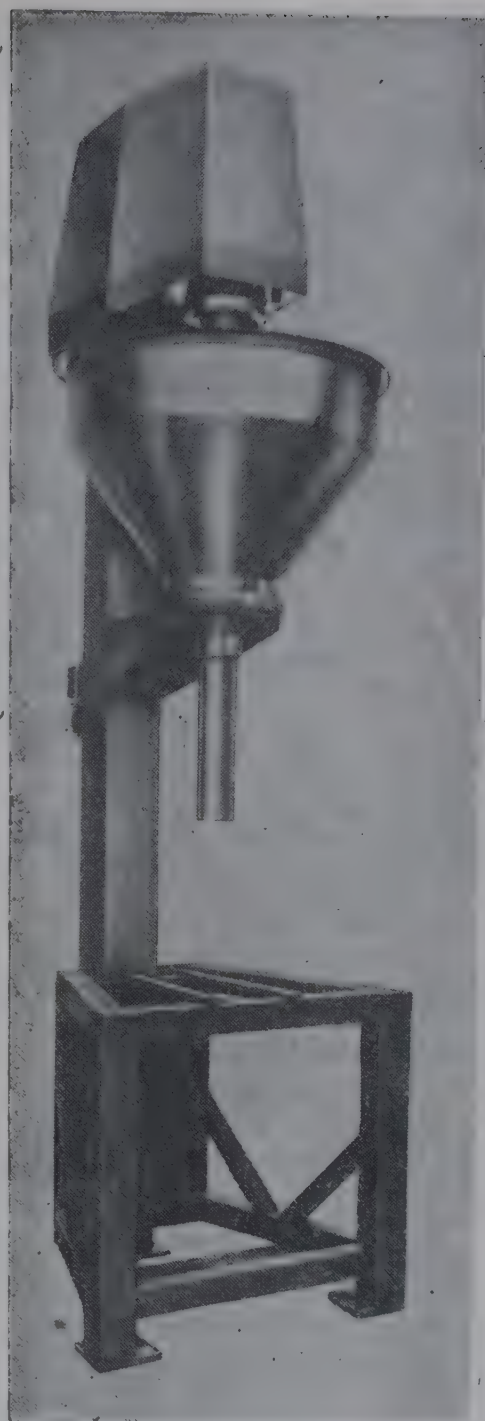
This machine will have the facility to be servo controlled from changes in bulk density of product and other trends provided by check weighing after filling.

The inherent accuracy of the filling machine coupled to such a system will provide high accuracy control of weight at quite high speeds, up to 80 fills per minute and, in some instances, more can be achieved by this single filling head. This speed of fill is, of course, dependent on the nature of the product and the size of fill into a given orifice.

The filling head is particularly suited to automatic combination with container handling systems and a machine has recently been supplied for filling 85 gm. of ground coffee at 80 fills per minute for a 'form, fill and seal' machine. The degree of accuracy is also dependent on the nature of the product, the speed of output, the style and orifice of container and also the quality of bulk material feed, a vital point in high-speed accurate filling. Allen Transmatic believe that many applications will be consistent within a total error of 1 per cent.

Powder Filling System designed specially for large bulk containers

This is a completely new approach to high accuracy filling of large containers and weights, offered by Allen Transmatic Limited in association with Darenth Weighing



The Allen 'Jumbo' Transfil Model AT. 8, for filling large weights up to 112 lb. (51 kg.) into drums, sacks, etc.

Equipment Limited. Realizing the need for a machine to genuinely cover the continuous filling of large sizes of container, Allen Transmatic announce their new 'Jumbo' Transfil Model AT. 8. Designed basically on the lines of their successful Transfil AT. 1, the machine has been made genuinely heavy-duty to serve the needs of

companies packing products in sizes ranging from 7 lb. (3.2 kg.) up to 100 lb. (45 kg.) and in many instances more, which are considered too heavy for the smaller type of machine.

The machine will fill bulk quantities into tins, drums, lined drums, paper multiwall, hessian or plastic sacks. Though very useful and workman-like as a free standing unit, the potential of the machine is in its combination to complete systems for sack and drum filling. The line drawing shows the combination of a bulk feeding system with a final topping up fill to a high degree of accuracy.

Co-operating with Allen Transmatic in this project are Darenth Weighing Equipment Limited, who have developed for this purpose a new 'Gnu-Weigh' high sensitivity pneumatic weigh head.

By this method, the feed of material into the container is controlled by weight. A mechanical load connection system, which ensures true weighing, brings the container load to a single point. This is supplied to a pneumatic pressure transducer which converts this weight signal to accurate proportional pressure. In creating this pressure, the transducer or weight head is free to bleed air which makes the pressure signal independent of atmospheric temperature and pressure changes. This transducer is comprised of a chamber covered by a cap into which air under pressure is allowed to enter. At a pressure determined by the load on the cap of the transducer, the air supports the load and this support pressure, which is proportional to weight, is used for control purposes.

The weigh head pressure signal is compared with a set pressure in a differential pressure switch. This switch takes the form of a two compartment chamber, the compartment being operated by a slack diaphragm. Upon equalization of pressure, the diaphragm actuates a low spring rate micro-switch which gives a changeover electric

cal signal. This signal, which may be pneumatic for flame proof installations, is used to terminate the flow of material from the feeder.

The mechanical arrangement of this weighing system may take one of many forms, depending upon the application. For small containers, a unit 18" long x 8" wide and 7" tall with a 6" square weigh platform would be used.

For the filling of bags or drums, a platform device or roller conveyor section may be utilised to ease handling, this also being weighed using the pneumatic principle described. Special precautions are taken on dusty applications to keep all horizontal surfaces to a minimum, thereby ensuring low tare variation.

The use of air in the transducer also reduces, to the minimum, the possibilities of powder contaminating the operating surfaces as fulcrums in conventional scales. The design of the transducer is such that a movement to the order of 0.001" is used for the full range. Platform movement is therefore negligible.

The outputs associated with various projects naturally will be determined by the size of the operation. Bags from as low as 7 lb. can be thought of in terms of handling up to 10 bags per minute; with 1 cwt. up to 1 per minute. Accuracies obtained with this new scale are in the order of a tolerance of 1 oz. on a 1 cwt. fill.

Refined Sugar

THE BOARD OF TRADE have announced in Notice to Importers No. 1161, dated September 24, 1966, that the simplified licensing arrangements for imports of refined sugar, announced in Notice No. 1144 of March 12, 1966, are being continued on the same basis for the next six months. The validity of open individual licences (prefixed 'AS') is hereby extended from September 30, 1966, to March 31, 1967 (Licence

documents should not be returned to the Board for amendment).

These licences continue to serve also to clear any Negotiated Price Quota sugar which polarizes at more than 98 degrees and are valid for imports from all sources except Southern Rhodesia.

Licence holders should continue to make regular monthly returns to the Board of Trade of quantities imported under their licences, by country of origin.

Metal Box Company

A £1m. extension to the Metal Box Co.'s machinery manufacturing section was opened by its Chairman, Lord Kings Norton at Shipley, Yorkshire, in June 1966.

This is the sixth factory to be opened by the company for the manufacture of canning machinery. The whole site covers 17 acres, and the factory 160,000 sq. ft. employing 550 work people.

When completed, it will be the largest of the six factories where machinery is made and sold at cost price to the 40 branches of the firm making cans and containers in metal, plastic and board.

Bottler & Packer

Awards for Induction-Seal Tumbler

The recent Maxwell House Coffee Premium offer, for which the coffee was packed in a glass drinking tumbler, has won two awards in the Starpacks competition organised by the Institute of Packaging—A Silver Star award by the British Aluminium Foil Rollers' Association for the best star-winning entry incorporating a significant part of aluminium foil.

The tumbler was designed by Mr D. R. Compton of Alfred Bird and Sons, makers of Maxwell House; the total pack developed by three companies in the United Glass Group—Kork-N-Seal Ltd. (liner and foil membrane) U G—Key Plastics Ltd. (Snap-

on-closure) and Ravenhead Glass Ltd. (tumbler).

The pack is sealed by the unique Kork-N-Seal induction head sealing process by which it was possible to fuse a membrane of specially coated aluminium foil to the thin straight rim of the glass tumbler. This ensures an air-tight and moisture-proof seal, essential to preservation of the full aroma and quality of the instant coffee, without the need for a screw cap prominent lip or bead finish.

The foil provides complete tamperproof protection but peels off cleanly when the housewife wishes to use the coffee. Subsequently the snap-on-closure shields the remaining coffee until it is all used, when the pack finally becomes an attractive drinking tumbler.

Maxwell House report that this is one of the fastest moving premiums that they have ever promoted. *Bottler & Packer*

Soft Drinks Statistics—First Half of 1966

A provisional estimate of the soft drinks production in the U.K. during the second quarter of 1966 has been issued by the Ministry of Agriculture, Fisheries and Food together with a revised estimate for the corresponding period in 1965.

These figures are shown below with the figures published for the first quarters of 1965 and 1966.

In the first six months of 1966, production of concentrated soft drinks reached 26.7 million gallons against 25.9 million gallons in the first half of 1965—an increase of 3.1 %. For unconcentrated soft drinks the figure was 122.3 million gallons against 115.2 million gallons, an increase of 6.2 %.

In terms of ready-to-drink equivalent, the Industry's output reached 256 million gallons in the first half of 1966 compared with 245 million gallons—an increase of 4.5%.

U.K. Production of soft drinks and fruit juices—million gallons (First Quarter of Year)

Period	1965										1966								
	Concentrated					Unconcentrated					Ready-to-drink equivalent	Concentrated				Unconcentrated			Ready-to-drink equivalent
	Squashes Cordials			Total	Carbonated	Fruit Juices	Other Types	Total	Squashes Cordials	Comminuted		Other Types	Total	Carbonated	Fruit Juices	Other Types	Total		
January	1.2	1.1	0.6	2.9	13.6	0.3	0.5	14.4	29	1.1	0.9	0.6	2.6	14.9	0.3	0.4	15.6	29	
February	1.1	1.2	0.5	2.8	12.8	0.4	0.5	13.7	28	1.3	1.4	0.5	3.2	14.6	0.3	0.4	15.3	31	
March	1.7	2.1	0.4	4.2	15.7	0.5	0.5	16.7	39	1.6	2.9	0.4	4.9	17.8	0.4	0.7	18.9	43	
Total of quarterly returns	4.0	4.4	1.5	9.9	42.1	1.2	1.5	44.8	95	4.0	5.2	1.5	10.7	47.3	1.0	1.5	49.8	103	
Estimated addition in respect of annual returns	...	...	...	0.1	...	...	...	2.7	3	...	...	...	0.1	...	...	...	3.0	4	
Total: January-March	...	...	...	10.00	...	...	...	47.5	98	...	...	...	10.8	...	...	...	52.8	107	
Second Quarter of Year																			
April	1.9	2.9	0.4	5.2	18.5	0.4	0.8	19.7	46	1.5	2.7	0.4	4.6	18.0	0.4	0.6	19.0	42	
May	2.2	2.9	0.4	5.5	19.9	0.6	0.9	21.4	48	1.7	2.9	0.5	5.1	20.7	0.6	0.7	22.0	47	
June	2.0	2.6	0.4	5.0	21.1	0.6	1.0	22.7	48	2.0	3.6	0.4	6.0	22.9	0.7	0.9	24.5	55	
Total of quarterly returns	6.1	8.4	1.2	15.7	59.5	1.6	2.7	63.8	142	5.2	9.2	1.3	15.7	61.6	1.7	2.2	65.5	144	
Estimated addition in respect of annual returns	...	...	...	0.2	...	...	...	3.9	5	...	...	...	0.2	...	...	...	4.0	5	
Total: April-June	...	...	...	15.9	...	...	...	67.7	147	...	...	...	15.9	...	...	...	69.5	149	

Summary for First Half of Year

Period	1965					1966				
	Concentrated	Unconcentrated	Ready-to-drink equivalent	Concentrated	Unconcentrated	Ready-to-drink equivalent	Concentrated	Unconcentrated	Ready-to-drink equivalent	Ready-to-drink equivalent
January-June	25.9	115.2	245	26.7	122.3	256	...	...	...	...

SPAIN

Importation of Preserved Foodstuffs

The Spanish authorities announced in the State Gazette of September 5, 1966, that, as from November 5, 1966, preserved foods, salted fish, meat preserves and their derivatives, and other food preparations for importation into Spain must carry the following information in Spanish:

- Country of origin.
- Classification of the product.
- Form of preparation (i.e., whether in olive oil, seed oil, tomato juice, etc.).
- Details of the ingredients.
- Any additives to the product (colouring, etc.).
- Net weight of the foodstuff expressed in decimals of kilogrammes and grammes, etc.).
- Instructions for the use of the product.
- In the case of a semi-preserved product, mention must be made in Spanish that it is a 'semi-préserve' and must be kept in a cold place', with details of the month and year of preparation.

The above information must be given on the container of the product itself or on a label firmly attached to the container. The size of the lettering to be used is as follows:

- For (b) above, not less than 3 millimetres.
For (c) above, not less than 2 millimetres.

Wording in other languages on the containers or labels is permitted provided that this does not cause confusion with the information in Spanish. The lettering in other languages can be smaller than that in Spanish.

BELGIUM

Schedule of the Soft Drinks Regulations

Classification	Soft drinks containing fruit juice	Soft drinks not containing fruit juice
<i>Description of soft drink</i>	Limonades au Jus de Fruits	Limonade (Fantaisie)
<i>Example</i>	Limonade au jus d'Orange, de Citron	Orange, Tonic, Cola
<i>Additions</i>		
<i>Fruit Juice</i>		
Grape		
Apple		
Apricot		
Strawberry	±	±
Pineapple		
Raspberry		
Black currant		
Citrus		
<i>Flavour</i>		
(a) Natural: obtained from natural products	+ ¹	+ ¹
(b) Fruit extracts	+ ¹	+ ¹
(c) Artificial: identical to those found in nature	+	+
(d) Artificial: not found in nature	+	+
<i>Sweetening Matter</i>		
(a) Sugar	++	++
(b) Dextrose	+	+
(c) Permitted artificial sweetening matter	+	+
<i>Acid</i>		
(a) Organic		
Citric acid	+	+
Malic acid	+	+
Tartaric acid	+	+
Lactic acid	+	+
Carbonic acid	+	+
Ascorbic acid	+	+
(b) Mineral		
Phosphoric acid	Max. 600 mg./l	Max. 600 mg./l
<i>Preservative</i>		
(a) Sulphurous acid or	Max. 50 mg./kg. fruit juice used	—
(b) Benzoic acid or	Max. 1000 mg./kg.	—
(c) Sorbic acid or	Max. 1000 mg./kg.	Max. 1000 mg./kg.
(d) Formic acid	—	—
<i>Foaming Agent</i>		
Saponins	—	—
Others	±	±

Classification	Soft drinks containing fruit juice	Soft drinks not containing fruit juice
Clouding Agent Bromine containing Free from bromine	— Only additives allowed by the Government Order of 28-10-64	—
Permitted colour	+	+
Caffeine	Max. 150 mg./l*	Max. 150 mg./l*
Quinine (Calculated also quinine hydrochloride 1 aq)	Max. 100 mg./l*	Max. 100 mg./l
Labelling Word suggestive of fruit	+	+
Pictorial device, suggestive of fruit	+ ¹	+ ¹

¹ When the essences have been made from materials of natural origin, the word 'Limonade' may be replaced by 'Orange' or 'Orangeade' and by 'Citron' or 'Citronnade'. In this case, a pictorial device of the used fruit is allowed.

- ++ Obligatory
- + Allowed (not obligatory)
- Prohibited
- ± Not regulated with declaration

Naarden News

ITALY

Milan Selected for 1967 IPACK-IMA

The executive committee of IPACK-IMA (International Exhibition for packing and packaging—Industrial food processing machinery—Mechanical handling) announces that the fifth edition of IPACK-IMA will be held in Milan, on the premises of the Milan Trade Fair and with the technical assistance of this organisation, from October 4th to 10th, 1967.

The exhibition will be divided up into three main sectors for the display of goods and equipment, as indicated in its official heading. Each of these will include the means and materials necessary for the different processing cycles.

Special emphasis will be placed on machines and equipment in both the pack-

ing sections and that devoted to industrial food processing machinery.

Some importance, too, however will be given to a mechanical handling in factories, as this is linked, at a technical and economic level, to the wider use of packing and to the processing of foodstuffs.

Bottler & Packer

CZECHOSLOVAKIA

Analysers of amino acids

The Czechoslovak Academy of Sciences have developed a new type of Analyser of Amino Acids and put under test an all-automatic amino-acid analyser of the HD-1200 E type. The apparatus is covered by Czechoslovak patents. The operation of this analyser, which is used for analysing fodder, is four to five times cheaper than that of currently used types and its output is at least three times greater. This apparatus was displayed at the International Exhibition of Agricultural Machines in Moscow.

AUSTRALIA

Tin in Tasmania

A Consortium, largely representing overseas interests, is now prospecting for tin in Tasmania.

It includes Charter Consolidated Ltd. of Britain; Bethlehem Steel Corporation of the United States; Ocean Science Engineering Inc., U.S.A., the Anglo-American Corporation of South Africa; and Ocean Mining A. G. of Switzerland. These are linked with an Australian company.

The prospecting group has selected six areas off the north coast of Tasmania for its operations.

Apple Sales

Australian apple shipments to Hong Kong, Singapore and the Philippines have risen steadily in the past five seasons from

INDIAN FOOD PACKER

350,000 bushels to 500,000 bushels. Almost six million bushels of apples and pears were shipped to Asia and Europe in 1965.

Steel-Tipped Fruit, Potato Peeler

Devised by Dalsonware at the request of housewives, the new 'Rhino' fruit and vegetable peeler has a new, patented stainless steel tip, firmly moulded into the plastic head. This enables eyes or blemishes to be removed from potatoes, apples or other fruits and vegetables being peeled.

The peeler is mounted in a boil-proof solid plastic handle. It is fitted with a double edged safety blade, ground to razor fine precision, and enabling right and left-handed users to operate this appliance with equal ease.

The Dalsonware 'Rhino' peeler can be used to peel vegetables and fruits, to string beans and to shred salad and other materials. It may also be used to slice vegetables and fruits.

The Company also makes a large range of other useful kitchen accessories. These include square section shashlik skewers, the Rollamatic can opener with replaceable gear wheels, a self-ejecting fruit corer, and 'easy-reach' handle with crocodile grip for scrubbing brushes, knife sharpener, fish knife and scaler, a concave spatula, nylon-coated potato mashers and a unique jar and bottle opener.

Production of Malt

Australian malt production is a highly specialised operation, carried out with modern electronically controlled machinery. Processes are to a large extent geared to the requirements of export markets—one leading Australian malt producer, Smith Mitchell and Co. Ltd. of Melbourne, exports nearly 50 per cent of its production.

During the manufacture of an export shipment, the quality of the malt is analysed continually. Samples drawn from each

batch give complete sampling of the entire shipment, and a specimen blended proportionately from the running samples is subjected to duplicate analysis.

The results, together with samples as required, are forwarded to overseas buyers and check samples of all export despatches are retained in the firm's laboratory for 12 months.

Barley

All tests are carried out according to the standards of the European Brewery Convention, or to the standards required by the particular export market. In Australia, two million acres of land are sown with barley. More than 12.5 million bushels of the barley produced are used for malt manufacture.

Exports of malt average four million bushels a year. When the selected shipments of barley arrive at the processing plant, they pass through a further process of selection as they are discharged into the receiving silo.

Small or broken grains, chaff and debris are separated from the graded barley, and only the healthiest and cleanest grain is conveyed to the storage bins. After weighing to determine the correct quantity for the initial process, the grain is transferred to the steep, where the moisture content is increased from 12 per cent to approximately 42 per cent. From the steep, the grain is centrifugally pumped into a saladin box or a drum, where it is allowed to germinate under scientifically determined conditions of temperature, humidity and air flow. During germination, a turning machine travels along the length of the saladin box, turning, and at times sprinkling the grain to facilitate germination and to prevent matting of the rootlets. In an alternative process, the turning of the grain is accomplished by rotation of the drum in which it is germinating.

Oil-fired kiln

After germination, the grain is conveyed to a high-speed, oil-fired kiln, where the germination process is arrested and the moisture content reduced to the required level. In modern kilns, controls ensure that characteristics of the malt such as flavour, colour and enzyme activity in keeping with specialised end uses. After the completion of the kilning process, cold air is blown through the grain to reduce the temperature of the mass and prevent further chemical changes in the malt, before it is discharged into holding bins. Next, the malt is moved to the cleaning plant by chain conveyors. Here the rootlets, which form an important by-product known as culms, are removed.

As it is a product essentially used by the food industry, the finished malt must meet the highest standards of health and food regulations.

Cleaning: After removal of rootlets and subsequent transfer to storage bins, the grain goes through yet another cleaning process before despatch. During this process, separation and selection of quality grain take place and broken or damaged grains are removed prior to final polishing. Extensive quality control governs every stage of processing. Comprehensive tests, to ascertain among other things, nitrogen and moisture content, germinative energy and capacity and water sensitivity, assist in determining the exact malting technique needed for individual batches. Research programmes continually examine new techniques and refine established methods to give optimum malting conditions for every batch of barley processed (Inquiries: Smith Mitchell and Co. Ltd., Gough Street, Richmond, Victoria, Australia).

Australian barley malt exports have risen sharply. Regarded as one of the best quality products available, barley malt is exported to nearly 20 countries.

In 1959-60, Australian barley malt exports amounted to 44,157,084 lb. worth \$A2,093,386. By 1964-65, this had risen to 162,475,400 lb. worth \$A7,849,882. The barley malt is used mainly by breweries in the manufacture of ales and beers. A small quantity is used for vinegar and malt extracts. The rise in exports is attributed to an increasing awareness of the suitability of Australian barley malt for brewing, and also its availability.

Over the past few years, new strains of barley have been introduced in Australia to meet brewers' requirements, and now all malting processes are laboratory controlled. Improved methods of agriculture have increased production from 34,170,000 bushels of 60 lb. each in 1959-60 at an average yield of 14.3 bushels an acre to 43,395,000 bushels averaging 22.5 an acre in 1963-64.

Australia's export trade in barley malt is shared among five major maltsters centred mainly in the south-east of the continent, where most of the barley is grown. One of these maltsters, Elliott and Magill Pty. Ltd. of Ballart, Victoria, is a major supplier to the Philippines, Japan, Okinawa, Fiji, Taiwan, Hong Kong and Africa. Because of increased overseas orders, the size of the plant, which already has a capacity of 33,600,000 lb. a year, is being greatly increased.

Australian Cheese Exports

When a new factory in the Australian State of Victoria reaches full production, it will represent a milestone in the history of cheese-making in Australia.

The factory, at Simpson in the Heytesbury district not far from Melbourne, will specialise in making fancy cheese for both local and export markets. Production has already started and the manufacturing company, Kraft Foods Ltd., is experimenting with a view to increasing its range of fancy cheese.

The new factory also will benefit dairy

farmers of the entire Heytesbury district, as it will take 40,000 gallons of milk daily.

Australia is one of the world's greatest cheese-producing countries. Exports go to more than 80 countries, as far apart as Japan and Zambia, the Persian Gulf and the U.S.A., the Philippines and Britain, the Pacific Islands and Mauritius.

More than 40 varieties are made in Australia, including blue vein, cheddar, creamed cottage cheese, cream cheese, edam, feta, gouda, mozzarella, parmesan, pecorino, pepato, provolone, ricotta, romano, samsoe, Swiss and taffel.

During the year ended June, 1966, Australia exported a record 56,317,928 lb. of cheese valued at \$A13,632,000.

Years of research and rigid quality control measures lie behind Australian cheese production.

Australian dairy farming is highly developed. Stock is grazed on well-tended pastures and great emphasis is placed on all-round cleanliness.

Milk is collected from the farms in stainless steel tankers and delivered daily to the factories.

It is pasteurised at 160 degrees Fahrenheit and then cooled to 86 degrees Fahrenheit before being piped into the big cheese-making vats, each capable of holding as much as 1,800 gallons.

After passing through different stages of production, the cheese is held in special maturing stores for anything up to nine months. Only then it is ready to be marketed.

Samples are analysed and tested at all stages of production and maturity to ensure quality and purity.

In the case of processed cheese, heating is so fast and controlled that no part of the protein, butter-fat or milk mineral content is lost.

All cheese for export is subjected to further rigid tests by the Australian Government Department of Primary Industry.

The cheese is graded for its moisture content and bacterial standards, and only if the specifications are correct can it be exported.

Today's complex cheese factory, backed by scientific research, is a far cry from the adventure of Kanana, an Arab traveller. As the fable goes he was the first cheese maker in the world, although accidentally.

Kanana took some dates and milk with him on a journey across the desert, but when he wanted to drink the milk he found a solid mass of curd. The milk was carried in a bag made from a sheep's stomach and the rennet in the skin, combined with the sun's heat, had started off the process of cheese-making.

Kanana missed the milk, but he liked what he ate and the world got cheese!

Trade Information: Kraft Foods Ltd., Salmon Street, Port Melbourne, Victoria.

Bakery Ovens

An Australian-made bakery oven, made by Baker Perkins Pty. Ltd. of Melbourne, has found ready markets in New Zealand, Japan and East Africa.

Called the Westwood Simplex, the ovens range from a 70-tray model capable of baking about 2100 1½ lb. loaves an hour to a 30-tray unit which bakes 900 loaves an hour.

The oven is so built that steam is retained in the chamber. This enables a highly glazed finish to be baked on upright varieties of bread solely by utilising the steam produced during baking.

Food Wrapping Machine

An automatic high-speed food wrapping machine which uses heat-activated shrink film as a wrapping material has just been released by Franklin Electric (Aust.) Pty. Ltd. of Dandenong, Victoria.

The machine, known as the F502, is designed for supermarket handling of meat

portions and other foodstuffs. It incorporates a shrink tunnel, specially designed to shrink the wrapping film without affecting the contents of the package. The machine's wrapping and sealing rate of 30 packages a minute can soon be achieved by even an untrained operator.

An automatic weighing and labelling unit is available as an extra.

Bread for Export

Traditional Dutch-style rye bread is now being exported from Australia.

Made in Sydney by M. Funke and Sons Pty. Ltd., the bread is marketed in two forms—sliced and wrapped in 'Cellophane', or canned.

The sliced bread can be supplied in 12-ounce packs each containing about 13 slices. The canned bread comes out of its one-pound tin as a rye roll which is sliced as desired.

Bakery Equipment for India

The Australian Government has announced the names of five Australian firms which will supply equipment for the construction of bakeries in India under the Colombo Plan.

The equipment, valued at approximately \$A850,000, is for the construction of bakeries at New Delhi, Calcutta, Madras, Ernakulam, Ahmedabad and Bombay.

The major suppliers will be Baker Perkins Pty. Ltd. of Melbourne which will make plant valued at over \$A550,000.

Other contracts have been awarded to A.M.F. Co (Aus.) Pty. Ltd., Vic Ewen & Son Pvt. Ltd. and Brown & Kidd Pty. Ltd.

Supervision

As major contractors, Baker Perkins Pty. Ltd. is responsible for the implementation of the project and will send engineers to India to supervise the erection, installation and commissioning of the plants.

Equipment to be supplied by Baker

Perkins includes ovens, final provers, slicer-wrappers, Depan-O-Vacs, conveying and cooling equipment.

Most of the plant has been designed in Australia by Baker Perkins with the emphasis on maximum automation combined with ease of operation.

The equipment was requested by the Indian Government following a comprehensive survey of India's bread making industry by the director of the Bread Research Institute of Australia, Mr E. E. Bond.

U.A.R.

Port Said Free Trade Zone

A republican Decree, establishing the Port Said Free Trade Zone, provided for exemption from customs duties, income taxes and economic restrictions was released on August 29, 1966. Several important steps have since been taken towards the implementation of the free trade plan over a period of eight years. These steps include: Taxes and Duties.

An ad-hoc committee representing the Taxes and the Customs Administrations has made a study of taxes and other duties to be applied to the zone, and drafted regulations in this context, which would shortly be released. Care had been taken that such levies would be the lowest all the world over.

Labour

Port Said's labour offices are compiling lists of workers and skills, for employment within the zone in line with operating companies' requirements. Lists are also being prepared of workers who could receive vocational training.

Construction

Arrangements will be discussed with the Port Said governorate to lay down a housing plan to cope with the increasing number of workers arriving in the city for employment.

Until such time as Port Said will be converted into an industrial free city, free zones may be established in Port Said governorate by decision of the Authority's Board, determining the location and limits of the free zones.

Subject to the provisions of the laws and regulations regarding the prohibition from circulation of certain merchandise or materials, foreign goods imported into the Port Said Free Zone shall not be subject to ordinary customs procedures applicable to imports nor to customs taxes and duties except as provided, in this law. The same is applied to all materials, machinery and equipment imported for the authorised establishments in the zone.

Under article II, a percentage of not less than 20 per cent of the Authority's net income will be set aside to finance projects related to the development of the Free Zone.

The Authority which enjoys an independent legal personality is vested with all powers necessary for the purpose of acquiring land and immovable property including the compulsory acquisition of private property for public utility purposes according to law. It is also empowered to authorise the occupation of land and immovable property owned by it or by others whether to discharge the purpose for which it has been established or to afford welfare benefits to its personnel or to establish projects and utility services connected with or necessitated by the work in the Free Zone.

The Authority is permitted to depart from the provisions of Law No. 129 of 1962 concerning the participation of the General Egyptian Authority for Maritime Transport in some companies and establishments and the organization of business connected with maritime transport.

Merchandise withdrawn from the Free Zone shall be subject to customs taxes and duties if such merchandise were imported from abroad. Goods containing local mate-

rials shall be exempted from such taxes and duties in the proportion of local materials involved in their manufacture.

Occupation duties shall be collected on merchandise deposited in the Free Zone according to executive regulations to be laid down.

Commercial and industrial establishments set up in the Port Said Free Zone shall be exempted from the provisions of the fiscal laws now in force or which may in future be applied.

Egyptian currency is not to be brought into or taken out of the Port Said Free Zone except upon the conditions and subject to the formalities specified by the executive regulations.

The provisions of the laws on nationalisation and on Joint Stock Companies and the related laws now in force shall not be applicable to foreign capital authorized to be invested in the Port Said Free Zone.

The provisions of Law No. 80 of 1947 organising the control of exchange operations will not apply to the operations which take place in the Port Said Free Zone. Executive regulations will indicate the rules governing transactions in which one of the parties has the nationality of the United Arab Republic or is a foreigner having the status of a resident for the purpose of the provisions of the law referred to.

The revenue of the Authority shall consist of:

- The credits allocated to it by the State;
- The income resulting from its activities;
- The local or foreign loans approved by the Prime Minister.

Revenues derived from work, such as wages, salaries, indemnities and payments of a similar kind paid by the commercial and industrial establishments erected in the Port Said Free Zone to foreign workers employed therein shall be exempted from the General Income Tax. Foreign funds invested in the Free Zone shall also be

exempted from Inheritance Tax and devolution duties.

The provisions of all laws regulating quarantine procedures and sanitary duties and sanitary and agricultural quarantine duties for the protection of plants against epiphytic and parasitic diseases originating abroad shall be applicable to Port Said Free Zone. The Management Board of the Authority shall lay down the executive rules, necessary for the implementation of the said provisions in the Zone.

All laws and decrees concerning the prohibition of dealings with Israel shall apply to Port Said Free Zone.

So far the Port Said Free Zone has received 115 offers to launch projects in the Free Zone. These include 70 foreign offers, 15 offers jointly made by foreign and national organizations and 30 national offers. A thorough study of these offers is being conducted to assess their value before choosing some of them. Foreign banks will also be permitted to establish branches inside the Free Zone from which the workers will cash their wages.

The Counsellor (Commercial), Embassy of India, Cairo, has forwarded a full text of the 62-article law establishing the Port Said Free Trade Zone to the various authorities and Export Promotion Councils in India. Firms or individuals interested in setting up industries, etc., in the Free Zone may contact these authorities for detailed information.

Indian Trade Journal, October 19, 1966

Revaluation of Rupee for the Unimplemented Portions of Contract of the Trade Agreement

A U.A.R. Trade Delegation had discussions from 17th August to 5th September, 1966, in New Delhi on issues arising out of devaluation of the Indian Rupee and a Protocol was signed on 5th September. According to the new Protocol, existing but not yet executed contracts or unimplemented portions of such contracts for export of goods from the two countries will be revalued in terms of Rupee by 57.5 per cent in line with the new par value of the Rupee. The Central Exchange Authorities, Cairo, have issued the necessary instructions to the various banks to enhance the value of the Letters of Credit accordingly. The trade which had come to a standstill after the devaluation has again spurred up.

SAUDI ARABIA

Jeddah Seaport Expansion Project

It is learnt that the implementation cost of the third and final phase of the Jeddah seaport expansion project has been estimated at Saudi Rials 121,165,000.

The port of Jeddah is currently being enlarged to keep pace with steadily rising traffic in its capacity as the biggest commercial harbour and place of entry for pilgrims to Mecca. It may be mentioned here that a new port at Yanbu on the Red Sea was opened recently to handle traffic for Medina and the surrounding area and to ease the strain on the busy port of Jeddah.

Export News

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- *List of parties interested in importing processed foods from India*
 - *Reserve Bank of India Notice to Exporters*
 - *Export of Processed Foods*
 - *Standing Export Publicity Advisory Committee*
-

List of parties interested in importing processed foods from India

1. M/s Balestrieri Sales Co., 25 California San Francisco, California.
2. Mr C. Van Kjeeffs, President, Globe Internal, P.O. Box No. 1403, Detroit Mich, 48226.
3. M/s Trade Links, P.O. Box No. 1503, Jeddah.
4. M/s Overseas Traders (Glasgow) Ltd., 103, Wilton Street, Glasgow, N.W.
5. M/s B. Aurora (Overseas) Co., 10 First Avenue, Wembley, Middlesex.
6. M/s Jins Company, Room No. 8-9, P.O. Chun Chambers, Hong Kong.
7. M/s Lee Mckeand and Son Pvt. Ltd., 53-55, Commercial Road, South Varra, Victoria.
8. M/s Vagadia & Co. (Ethiopia) Ltd., No. 1212, Addis Ababa, Ethiopia, Africa.
9. M/s Mohamed Abdul-Aziz Wazzan, Post Box No. 201, Mecca, Arabia.
10. The Asia Trade Association, C/o Osaka Chamber of Commerce & Industry, 1, Nishimachi, Dojima, Kita-ku, Osaka, Japan.
11. M/s Seiwa Trading Co. Ltd., 23, 1-Chome, Takaba. cho, Nakamura, Nagoya, Japan.

12. M/s Balfour, Guthrie & Co. Ltd., 225, California Street, San Francisco, U.S.A.

13. M/s M. M. Panie, Dujac, 90, Rue de la Victoire, Parix IXeme, France.

Reserve Bank of India Notice to Exporters

'Notice to Exporters No. 3 of 1966' issued by the Exchange Control Department of the Reserve Bank of India, Bombay-1, is reproduced:

'Attention of the exporters is drawn to the Notice to Exporters No. 2 of 1966, dated the 14th September, 1966, issued by the Reserve Bank of India whereby exporters are required to obtain a code number from the Reserve Bank before 1st November, 1966 and to quote it below their signatures on all copies of the form GR/EP/VP/COD submitted to Customs/Postal authorities on and after the above date. It has now been decided to extend the date for obtaining code number upto 30th December, 1966. Exporters who have not so far applied to the Reserve Bank for the code number should do so without further delay.

Exporters who have already obtained their code numbers from the Reserve Bank should cite the code number on the G.R. etc., forms lodged by them with the Customs/Postal authorities on or after 1st November, 1966'.

Export of Processed Foods

Shri Manubhai Shah, Minister of Commerce, made the following statements in the Lok Sabha on the 4th November, 1966.

1. 'The major items of processed foods exported are fruit and vegetable products;—dried, preserved, dehydrated and frozen; pickles—all sorts; juices, pulps, preserves; candied and crystallised fruits; jams and jellies; confectionery; biscuits; starch and its derivatives; liquid glucose and dextrose; coca-cola concentrate; dairy products including malted milk products; guar gum.

The following steps are taken to promote the production of processed foods:

- (1) New areas for the production of processed foods are being identified and manufacturing licences are being given.
- (2) Sophisticated machinery required for increased production for exports as well as raw materials and spares are being given liberally.
- (3) Sugar is being supplied to the industry for the production of processed foods in an expeditious manner; for the quantity required for exports, sugar at international price is proposed to be given.
- (4) To ensure adequate supply of containers for packing food products open top sanitary cans have been classified as a priority industry'.

2. 'A scheme is being issued providing for the State Trading Corporation and the Minerals and Metals Trading Corporation to maintain stocks of imported raw materials in their depots at different port towns, for supply to manufacturers for export production. Allotment of such supplies will be made in lieu of the import licences permissible to manufacturers under the import policy for registered exporters. These two Corporations will be issued initial import licences for a total of Rs 3 crores to import materials like non-ferrous metals, tinplate, steel sheets of certain gauges, raw wool, some chemical raw materials, etc'.

Standing Export Publicity Advisory Committee

Resolution (No. 68-Pub. (5) /66 dated the 31st October, 1966) of the Government of India in the Ministry of Commerce:

'The question of constituting an Advisory Committee to give guidance in planning and implementing export publicity programmes through various media has been engaging the attention of the Government of India for sometime past. The Government of India has accordingly decided to set up a Standing Export Publicity Advisory Committee consisting of the following persons to conduct such a review and to make recommendations to the Government on the subject:

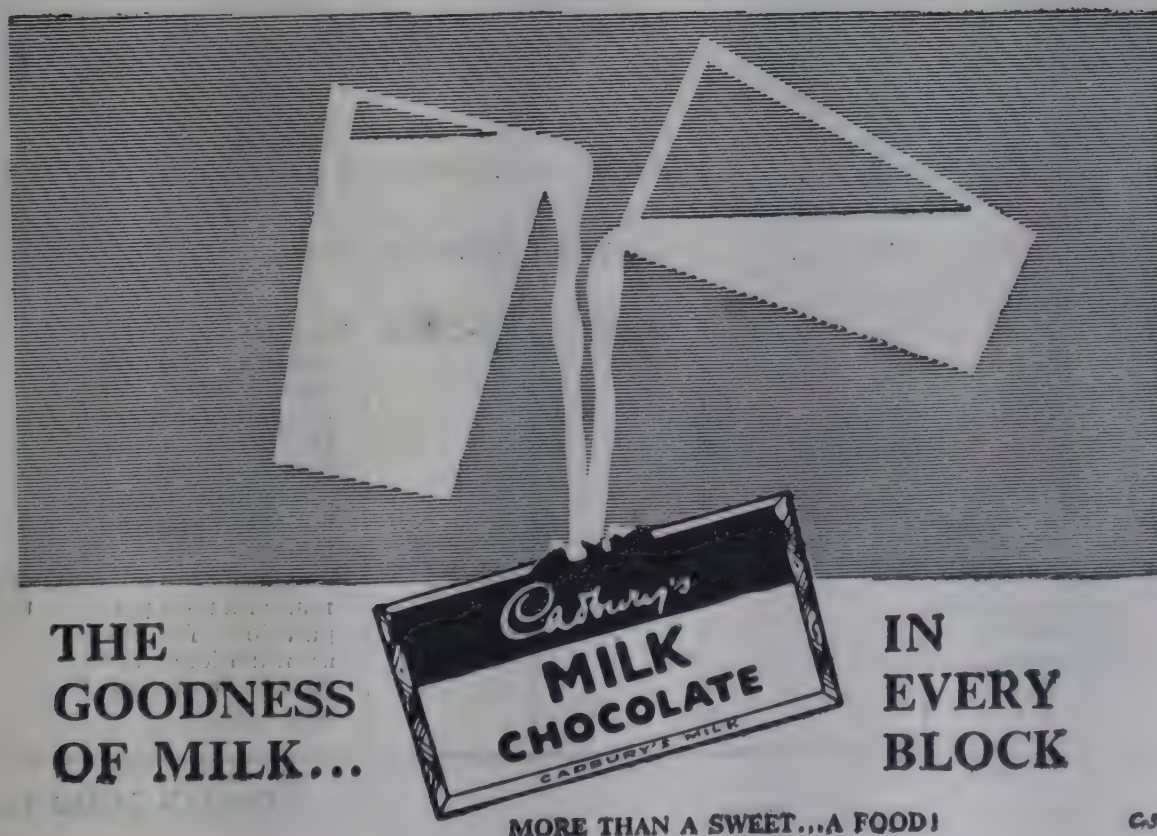
Chairman

1. Shri H. D. Shourie, Director-General, Indian Institute of Foreign Trade, New Delhi.

Members

2. Brigadier R. Sreenivasan, Director of Advertising and Visual Publicity, 'B' Barracks, Curzon Road, New Delhi.
3. Shri T. N. Bahel, Chief Controller of Printing and Stationery, Nirman Bhavan, New Delhi.
4. Shri U. S. Mohan Rao, Director, Publications Division, Ministry of Information and Broadcasting, Old Secretariat, Delhi.
5. Dr G. S. Rao, Director-General of Commercial Intelligence and Statistics, 1 Council House Street, Calcutta 1.
6. Shri S. N. Limaye, Controller of Films Division, Ministry of Information and Broadcasting, 24 Peddar Road, Bombay 26.
7. Shri V. K. Narayana Menon, Director-General, All India Radio, Broadcasting House, Parliament Street, New Delhi 1.

8. Shri B. Rangaswamy, Joint Editor, 'Commerce', Brady House, Veer Nariman Road, Bombay 1.
 9. Shri V. Balasubramanian, Editor, 'Eastern Economist', M/s The Eastern Economist Ltd., United Commercial Bank Building, Parliament Street, P.B. No. 34, New Delhi.
 10. Shri T. K. Seshadri, News Editor, 'Economic Times', P.O. Box No. 213, Dr Dadabhoy Naoroji Road, Bombay 1.
 11. Shri Edward J. Fielden, Managing Director, M/s J. Walter Thompson Co. (P) Ltd., Lakshmi Building, Sir Phirozshah Mehta Road, Bombay 1.
 12. Shri P. L. Palmer, Managing Director, M/s Benson Ltd., Steelcrete House, Dinsha Wacha Road, Bombay 1.
 13. Shri K. C. Raman, Production Manager, The Times of India, Dr D. Naoroji Road, Bombay 1.
 14. Shri J. P. Guha, Manager, Shri Saraswati Press Ltd., 32 Acharya Prafulla Chandra Road, Calcutta 9.
 15. Shri R. K. Singh, Secretary, Engineering Export Promotion Council, 14/1B Ezra Road (3rd Floor), Calcutta 1.
 16. Shri O. P. Dhawan, Secretary, Silk and Rayon Textiles Export Promotion Council, 'Rasham Bhavan', 78 Veer Nariman Road, Bombay 1.
 17. Shri K. S. Verma, Director of Tea Promotion, Tea Board, 14 Bra-bourne Road, Calcutta 1.
- Member-Secretary*
18. Shri V. R. Rao, Director, Dte of Commercial Publicity, Ministry of Commerce, Udyog Bhavan, New Delhi.
2. The terms of the reference of the Committee will be to provide guidance for the effective implementation of the programmes in regard to:
- (i) Coverage and presentation of material;
 - (ii) measure of implementation of programmes;
 - (iii) media of publicity; and
 - (iv) toning and improving the standards.



TRADE MARKS

Trade Marks accepted by the Trade Marks Registry

Sl. No.	Name and address of Applicant	No. and Date of the Trade Marks Journal publishing the Trade Mark	Official No. of Trade Mark	Date	Products	Trade Mark
M/s.						
1.	Unilever Limited, Port Sunlight, Cheshire, England	417 16-10-1966	230,435-B	27-7-1965	Edible oils and edible fats; cheese and cheese products (for food); milk and other dairy products (for food)	May-Rose (Class 29)
2.	Jemar Products, Unit G-6, Industrial Estate, Dindigul, Madurai District, Madras State	417 "	234,709	13-4-1966	Fruit jellies and jams, preserved and/or tinned, cooked or dried fruits, vegetables, fish, fish preparations, meat and meat extracts, all included in class 29	Rejo (Class 29)
3.	Daw Sen & Company Private Limited, 29, Dr Suresh Sirkar Road, Entally, Calcutta 14	417 "	221,625	7-4-1964	Brewed vinegar	Kangaroo (Class 30)
4.	Unilever Limited, Port Sunlight, Cheshire, England	417 "	229,149	27-5-1965	Dehydrated sauces, tomato based sauces, yeast, baking powder; flour and preparations made from cereals; non-medicated confectionery and spices	Golden Ladle (Class 30)
5.	Daniel Carasso, Ibis, Boulevard Richard Wallace, Neuilly-sur-Seine (Seine), France	418 1-11-1966	229,965	8-7-1965	Yoghurt, Yoghurt preparations and dairy products for food included in class 29	Danone (Class 29)
6.	Sardar Singh Kuldip Singh, 6675, Khari Baoli, Delhi 6	418 "	224,968	21-10-1964	Pickles	Raj Kamal (Class 30)
7.	S. Nivas Murabbawala, 11, Alilal Building, Pydhonie, Bombay 3	418 "	216,870-B	31-7-1963	Honey	Rocket Brand (Class 30)
8.	The Food Corporation of India, 153, Mount Road, Madras 2	418 "	233,842	22-2-1966	Rice, atta, suji, maida, broken pulses ready for use and flour from the dhals, maize (coarse-milled), maize flour, sugar, tapioca, tapioca flour	...
9.	F. Hoffmann-La Roche & Co. Ltd., 124-184, Grenzacherstrasse, Basle, Switzerland	418 "	234,161	14-3-1966	Food stuffs for animals and food preparations for use as nutritional additives to animal foodstuffs	Catropam (Class 31)

Sl. No.	Name and address of Applicant	No. and Date of the Trade Marks Journal publishing the Trade Mark	Official No. of Trade Mark	Date	Products	Trade Mark
M/s. 10.	Standard Oil Company, 30, Rockefeller Plaza, New York	418 1-11-1966	234,968	27-4-1966	Fruit juices, non-alcoholic refreshing drinks; syrups and other preparations for making non-alcoholic beverages	Protecel (Class 31)
11.	Sailor's Corporation, 3540, Qutab Road, Delhi 6	420 1-12-1966	229,571	16-6-1966	Corn flour, mustard powder, pepper, gelatin and vinegar, for sale in the States of Punjab, Rajasthan, Madhya Pradesh and the Union territory of Delhi	Sailor White Pepper (Class 30)
12.	Cow & Gate Limited, North Street, Guildford, Surrey, England	421 16-12-1966	222,484-B	25-5-1964	Diary products for food	Cow and Gate (Class 29)
13.	Paradise Milk Products, Gulaothi, Uttar Pradesh	421 „	225,570	25-11-1966	Milk products	Queen of the World (Class 29)
14.	Van Den Berghs & Jurgens Ltd., Unilever House, Blackfriars, London E.C. 4, England	421 „	223,976	25-8-1966	Margarine	Flora (Class 29)
15.	Anubhai Hirabhai Amin, Kunj Society, Alkapuri, Baroda 5	421 „	236,784	2-8-1966	Preserved, dried and cooked fruits and vegetables, jellies for food, jams; preserves and pickles	Vafa (Class 29)
16.	Unilever Limited, Port Sunlight, Cheshire, England	421 „	229,150	27-5-1966	Minerals and aerated waters and other non-alcoholic drinks; syrups and other preparations for making beverages included in Class 32	Calova (Class 32)
17.	Red Club Products Corporation, 19/21, Shakti Nagar, Delhi	421 „	231,955-B	26-10-1966	Aerated waters	Tanza vitaminized (Class 32)

Government Notifications

- *Customs Act, 1962*
- *Export of Onions*
- *Export of Tapioca Fibre and Waste*
- *Recommendations of Tariff Revision Committee and Government of India's decisions*

Customs Act, 1962

Customs Act, 1962: drawback allowed in respect of imported materials used in manufacture of certain goods when exported: Further amendment.

The following Notification [G.S.R. 1353 (No. 168/F.No. 1/109/65-DBK-Customs), dated the 3rd September, 1966] has been issued by the Government of India in the Ministry of Finance (Department of Revenue and Insurance):

In exercise of the powers conferred by sub-section (1) of section 75 read with sub-section (3) of section 160 of the Customs Act, 1962 (52 of 1962), the Central Government hereby makes the following further amendment in the notification of the Government of India in the Ministry of Finance (Department of Revenue) No. G.S.R. 575 (55/F. No. 34/86/60-Cus. IV) dated the 28th May, 1960, namely:

In the Schedule to the said notification, after serial No. 316 and the entries relating thereto, the following shall be added, namely:

'317 Sanitary cans used as containers for the export of:

- (i) fish and fish products;
- (ii) fruit and vegetable products; and
- (iii) condensed milk

and manufactured out of imported tin-plates'.

Export of Onions

The following Trade Notice (No. G-106/66 dated the 10th October, 1966) has been issued by the Joint Chief Controller of Imports and Exports, Calcutta:

Reference this office Trade Notice No. G-76/66 dated the 7th July, 1966, on the above subject.

2. It has now been decided that with immediate effect, the floor price of onions will be as follows:

(a) for Ceylon

On C.I.F. Colombo basis Rs 452 per tonne

(b) for all other destinations

On F.O.B. basis Rs 400 per tonne

All other instructions contained in the office Trade Notice No. G-61/66 dated the 2nd June, 1966, will, however, remain unchanged.

Export of Tapioca Fibre and Waste

Trade Notice No. G-116/66 dated the 5th November, 1966, issued by the Joint Chief Controller of Imports and Exports, Calcutta.

Reference Trade Notice No. G-115/66 dated 5th November, 1966, reproducing Export Trade Control Order No. E (C) O, 1962/AM (114) dated 29th October, 1966.

2. It is notified for the information of the trade that in terms of the above order, export of Tapioca Fibre and Waste has been decontrolled and their exports will now be allowed without any Export Trade Control formalities. There will, therefore, be no longer any distinction between the Tapioca Fibre and Waste of Kerala origin and of 'Other Origin' from the point of view of exports.

Recommendations of Tariff Revision Committee and Government of India's decisions

Resolution No. 3 (46)-TRC/66 dated the 6th October, 1966.

The Government of India in the Ministry of International Trade appointed, on March 17, 1964, a Tariff Revision Committee under the chairmanship of Shri S. Subramanian to conduct a comprehensive enquiry into the structure of the Indian Customs Tariff, to recommend the lines on which it might be revised and improved, to examine the related enactments and to suggest the necessary amendments thereto. The Committee which included representatives of trade interests and the concerned Government Departments, was primarily concerned with the question of tariff nomenclature and description (as apart from the rate structure of the tariff).

2. The Committee has since submitted its final Report on the Customs Tariff. After examining the possible alternative classifications, the Committee has recommended that the revised Import Tariff should adopt the broad structure of the Brussels Tariff Nomenclature (BTN) with such contracts and expansions as might be necessary in the light of India's trade patterns, development needs and other

factors, and that in the matter of expansion i.e., opening of subheadings, reference should be freely made to the Revised Indian Trade Classification (R.I.T.C.).

3. The revised Import and Export Tariff Schedules drafted by the Committee are contained in Part II of its Report. In presenting the draft Import Schedule, the Committee has indicated how it could be further simplified if certain minor adjustments in import duty can be made. It has also observed that some of the changes which it has recommended for the purpose of rationalisation would require the concurrence of countries with which India has trade or tariff agreements. In addition, the Committee has made a number of other recommendations on connected matters falling within its terms of reference.

4. Government generally agree with the Committee's main conclusions indicated above. A very careful and detailed study of the draft Schedule would, however, be necessary before these recommendations be implemented through appropriate legislation. Administrative steps would also have to be taken to prepare the trade as well as Customs Administration for a smooth transition to the new Schedule. This process, which is bound to take some time, has already been initiated.

Men and Companies

- *Dr D. V. Karmarkar*
 - *Shri R. L. Dang*
 - *Zenith Tin Works Pvt. Ltd.*
 - *M. M. Poonjaji & Co.*
 - *Konkan Canned Food Products Pvt. Ltd.*
-

Dr D. V. Karmarkar



Dr D. V. Karmarkar joined the Indian Standards Institution in September, 1954, as Deputy Director (Marks). In 1958, he took over charge of the Agricultural and Food Products Department and rose to the office of Joint Director (Marks) in 1964. He was designated Deputy Director-General (Marks) in March this year.

Dr Karmarkar received his early education at Fergusson College, Poona and took his M.Sc. degree in biochemistry from Bombay University on the strength of his

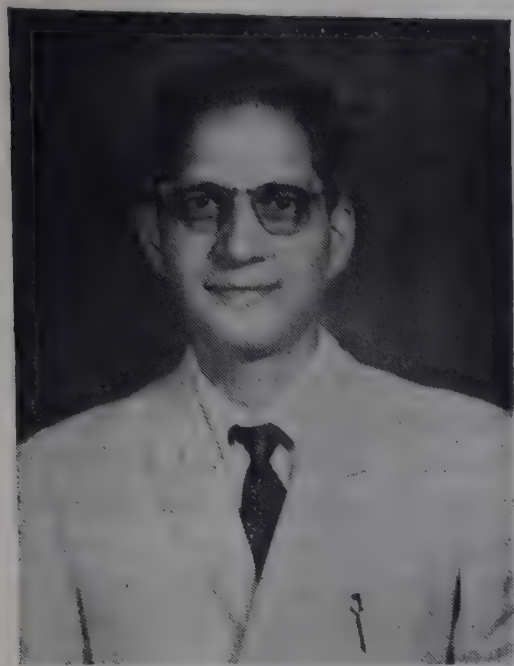
research work at the Indian Institute of Science, Bangalore. He proceeded to U.K. for specialization in agricultural chemistry. He obtained his Doctorate in 1933 from the Long Ashton Fruit Research Station of the University of Bristol. Dr Karmarkar also holds a First Class Certificate from the same university in fruit and vegetable preservation.

After his return from U.K. in 1934, Dr Karmarkar was appointed Officer-in-charge at the Cold Storage Research Station of the Imperial Council of Agricultural Research at Ganeshkhind, Poona. Soon after, a deputation assignment from the Council took him to U.K. and Europe (1936) for studies on gas storage of fruits and vegetables.

Dr Karmarkar joined the Processed Foods Directorate of the Ministry of Industry and Supply (1942) as Assistant Director. Subsequent to the transfer of this Directorate to the Ministry of Food, he worked as Technical Adviser looking after the development of the processed food industry in the country. He was responsible for initiating the scheme for quality control of vanaspati on all-India basis.

Dr Karmarkar has been the Founder-member of the Society of Biological Chemists (India) and a Fellow of the Institution of Chemists (India). He has also been responsible for drafting the original plan of the Central Food Technological Research Institute, Mysore.

During his service in ISI, Dr Karmarkar has represented India at the ISO meetings of the Spices and Condiments Sub-committee and the Stimulant Foods Sub-committee at Budapest, Paris and Ankara.



Shri Dang, till recently Scientist-in-charge, Central Food Technological Research Institute Experiment Station, Jammu, has now joined as Chairman, Discipline of Food Technology, Regional Research Laboratory, Jammu.

After graduating from the Punjab University in 1946, Shri Dang studied Fruit Technology at the Indian Institute of Fruit Technology, Delhi and obtained post-graduate Diploma in 1949. He was awarded the Associateship of Central Food Technological Research Institute in 1960.

In 1955, he joined the Directorate of Fruit Utilization, U.P., where his main activities were directed towards extension and industrial liaison. He was responsible for the successful establishment of U.P. Government Community Canning Centre at Dehra Dun. During his stay there between 1955 and 1960, he worked in the Forest Research Institute, on problems connected with fruit utilization and its wastes. He evolved an improved method for the preparation of dehydrated mango pulp by which mango '*Papar*' could be prepared in a much shorter period.

In 1961, he worked for about a year with the Planning Research and Action Institute,

U.P., at their Food Processing project at Mahawa (Etawah). He worked out a number of schemes for the Institute for action research projects on fruit utilization. He again alternated his services with the private sector and worked with M/s Midland Fruit and Vegetable Products, Mathura, between 1961 and 1962 as Incharge, Production and Quality Control.

In 1963, Shri Dang joined C.F.T.R.I. as a scientist and has been responsible for the setting up of the Experiment Station of the Institute at Jammu. Consequent to his appointment with the Regional Research Laboratory, Jammu, a discipline of Food Technology has been established of which he has been made the Chairman. He has a number of publications, reports and write-ups to his credit.

Zenith Tin Works Private Limited

The Zenith Tin Works is a Private Limited Company with its registered office at Mahalaxmi, Bombay 34.

This company manufactures open top sanitary cans, general purpose containers, aluminium collapsible tubes, aluminium pilfer proof/roll-on caps and fancy trays.

Started on a modest scale, the company under the stewardship of the following directors has been able to secure business worth £30,000 from the Middle East and some African countries after a business trip to these countries.

Mr M. S. Barodawala

Mr S. S. Barodawala

Mr H. A. Barodawala

The Company has already exported goods worth over Rs 1.2 lakhs and in the meantime has contracted a further export business worth about Rs 25,000 for trays, collapsible tubes, pilfer proof caps, etc.

The Company is now engaged in the development plan to meet the increasing export demand and the mounting requirements of local consumers.

M. M. Poonjiaji & Co.

Messrs M. M. Poonjiaji & Company is a partnership Company established in the year 1883 with its registered office at Marine Street, Bombay 2.

Under the trade mark 'SHIP BRAND' 'Green Label', this company has been manufacturing and successfully exporting Mango Chutney, Mango and Fruit Pickles, Curry Powder, Bombay Ducks, Pepper Powder, Pappadoms, etc. Their annual exports are estimated on an average about Rs 8 lakhs, apart from the in-country sale which however is negligible.

The following are the partners of this company:

Shri D. F. Poonjiaji
Shri D. S. Poonjiaji
Shri C. S. Poonjiaji
Shri F. B. Poonjiaji
Shri K. B. Poonjiaji
Shri P. B. Poonjiaji

Konkan Canned Food Products Pvt. Ltd.

In the year 1960, four partners S/shri M. G. Lanjekar, V. K. Karekar, D. R. Kulkarni and P. D. Kodollikar started the Canned Food Products with a capital of Rs 290,000. The main activity of the firm was to export Mango Nectar and Mango Pulp.

In 1966, the Maharashtra Small Scale Industries Development Corporation Limited (A Government of Maharashtra Undertaking), selected this unit for equity

participation under the New Equity Participation Scheme launched by the Corporation. The firm 'Canned Food Products' was duly incorporated as a Private Limited Company and has been working under the name and style of Konkan Canned Food Products Private Limited. The plans for manufacturing canned and bottled food products are under way. It has also been galvanizing its machinery with a view to marketing a wide range of products: mango pulp, mango slices, mango nectar, jack fruit in tins, *Kokam* squash, lemon and orange squash, shrimps and all kinds of pickles, both at home and abroad. The Company has plans for exploiting the world market for its various products. Their well chalked out plans, it is hoped, will ensure all the year round activity. This would result in more employment for people and increase in the annual turnover. The Corporation lays great accent on the fact that this Company will be an export oriented one.

The Company enjoys another unique privilege of having outstanding personalities in the First Board of Directors: Shri G. B. Newalskar, the Chairman of the Maharashtra Small Scale Industries Development Corporation Limited; and the Managing Director, Maharashtra Minerals Corporation Limited, is the Chairman of the Board of Directors. Shri A. R. Bhat, a veteran in the field of Small Scale Industries, is a director. S/shri M. G. Lanjekar and P. D. Kodollikar are directors and Shri V. K. Karekar is the Managing Director.

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Poysha containers

bring it to you

Not only fruits but also other foods as well as pharmaceuticals, vegetable and mineral oils, paints and dyes...they all come to you in protective Poysha containers. Poysha serves all the major industries catering to your daily needs. Poysha's sales have increased eightfold in as many years: a phenomenal growth record indeed. Today, it ranks second among Indian container makers; but it is second to none in quality and service, thanks to its expert personnel, strict quality control and the most modern machinery.

To serve you even better, Poysha has joined hands with one of Europe's leaders



in packaging: Lubecawerke of West Germany. Now all of Lubecawerke's experience and expertise pooled in its Central Laboratory are available to Poysha for its large expansion programme. Its 3 new factories at Thana (Bombay), Ghaziabad (Delhi) and Cochin will soon be ready. Then it will make 5 containers for every 2 it makes today. What's more, it will offer comprehensive technical advice, better on-the-spot service and a wider choice of packaging materials to industries all over the country. For you, this will mean more and more of the better things you need...in Poysha containers — which even now run into millions every year.

POYSHA: ALREADY INDIA'S SECOND LARGEST CONTAINER MAKER—AND STILL GROWING RAPIDLY

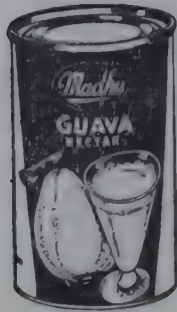


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CMP-21

delightful...
delicious...
different...



More than a dozen delicious varieties of Indian fruits and vegetables from which to choose. Try them all. You'll enjoy them.

Fruits : Mango Cheeks and Slices, Mango Pulp, Guava Slices, Papaya Chunks.

Nectar : Mango Nectar, Guava Nectar, Papaya Nectar, Tomato Juice.

Vegetables : Karela in Brine, Okra in Tomato Sauce, Tinda in Brine, Baked Beans in Tomato Sauce, Parwal in Brine, Kantola in Brine, Brinjal in Brine.



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slices and pulp
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- ★ JAMS
(of several varieties)
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- ★ MANGO CHUTNEY
- ★ PETHA, etc.



Greatest care is taken in selection of fruits and
their processing and that is why they are
always fresh and full of Vitamins.

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G. G. INDUSTRIES, AGRA (India)

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Drink Coca-Cola...Be really refreshed

LIVE WITH ZEST Life looks brighter—you'll feel gayer—after the first sip of Coca-Cola. It's wonderful zest refreshes as nothing else can. Yes—in all the world—nothing gives you the wholesome sparkle of Coca-Cola



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Canned fresh
Serves better
Tastes delicious

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(IN SYRUP)

These are fresh, because ripe pineapples are canned fresh from their own garden, under modern hygienic conditions.

THE CANNING INDUSTRIES COCHIN LTD., TRICHUR (KERALA STATE)



the Good
Hostess with
a Good taste
Always uses

Caico
BREWED
PINEAPPLE
VINEGAR

for curries - vegetable and non-vegetable.
She knows that it is prepared from garden-ripe Pineapples and its pleasing aroma and flavour gives a delicious taste.



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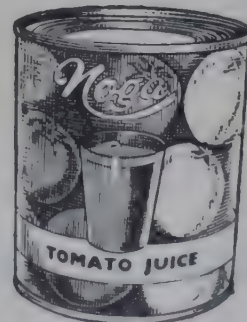
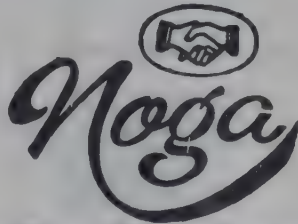


SISTA'S Cl-5

ठण्डा और स्वादिष्ट पेय



ठण्डे डिब्बों में रखे हुए नोगा आरेंज और टोमाटो के ज्यूस—याने ठण्डे और स्वादिष्ट पेय । मेहमानों की खातिरदारी में...भोजन के समय...या थकावट दूर करने के लिये इनकी बराबरी नहीं हो सकती । इनमें विटामिन भी भरपूर हैं । दोनों ने ही १९६४ की अखिल भारतीय नींबू और सब्जी प्रदर्शनी में प्रथम पुरस्कार प्राप्त किये हैं । नोगा आरेंज ज्यूस और मैंगो नेक्टर क्व: औंस के छोटे डिब्बों में मिलते हैं । नागपुर के बेहतरीत फलों का स्वाद लीजिये ।



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YOU
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There's a succulent wholesome preparation all-ready to - serve. The choice is yours. RENG0 takes the drudgery out of cooking.

Cocktail Sausages, Ham, Mutton Do Piazza, Keema Mutter, Korma Curry, Hot Dogs, Roghan Josh, Koita Curry, Luncheon Meat, Zerda, Biryani, Gurda Kapura, Bacon Rashers, Clear Soup, Liver Soup, Kidney Soup, Onion Soup, Corned Mutton, Mutton Loaf, and Mutton Cocktail Sausages.

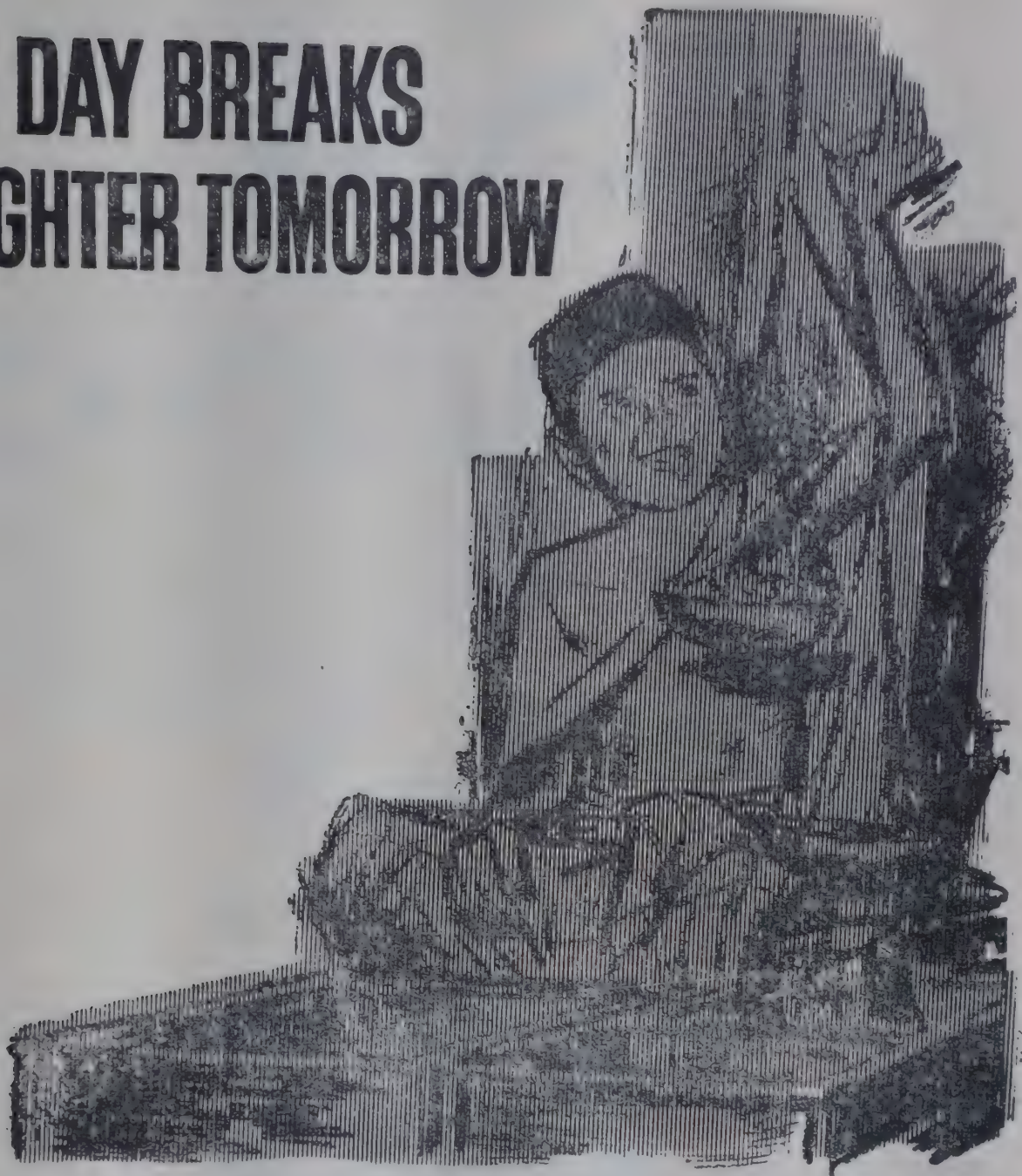


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PLAY BECOMES HAPPY SERVICE.

Today's service. Today's effort. Continuous, successive.

Work-laden, face shining with a smile.

Tomorrow...a little less of care, a little more of joy.

And for HINDUSTAN LEVER, too, tomorrow begins today.

In the research laboratory, in the factory and office.

Work, patience, care

to serve tomorrow's homes and the nation's needs
with products that grow better and better.

TODAY AND TOMORROW...HINDUSTAN LEVER SERVES THE HOME

WITH SOAPS, FOODS, TOILET PREPARATIONS

PR. 37-X52

Say “Cheese”

Saying it is easy. Making it from buffaloes' milk wasn't. There were problems. Like slow ripening. Lack of control over “body” and flavour .

It took us 3 years to solve these problems

Three years of solid work at the Kaira Co-operative's research laboratories



Finally we did it—by modifying the usual cheese-making process. AMUL CHEESE was worth all the effort and time spent on it.

The next time you're photographed, don't be surprised if you think of AMUL when you say “CHEESE”.



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where milk has
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CMKMP-49



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energy flags

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TP-5/62

Hard work drains energy. A good fortification against fatigue is Time Guava Juice because it contains vitamin C in abundance. This vitamin also helps resist infection and build body.

Human system can store up some of the vitamins but not vitamin C. A daily intake of vitamin C is therefore necessary for balanced health.

Your Doctor will tell you that Guavas are the richest source of natural vitamin C—many times more than citrus fruits like orange. A higher percentage of this vitamin is stable in Guavas than in oranges. Consequently more of it is retained after processing and canning and during shelf life. Taken daily Guava Juice will nourish your system with the essential vitamin C and build up a healthy body.

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Least expensive of fruit juices*



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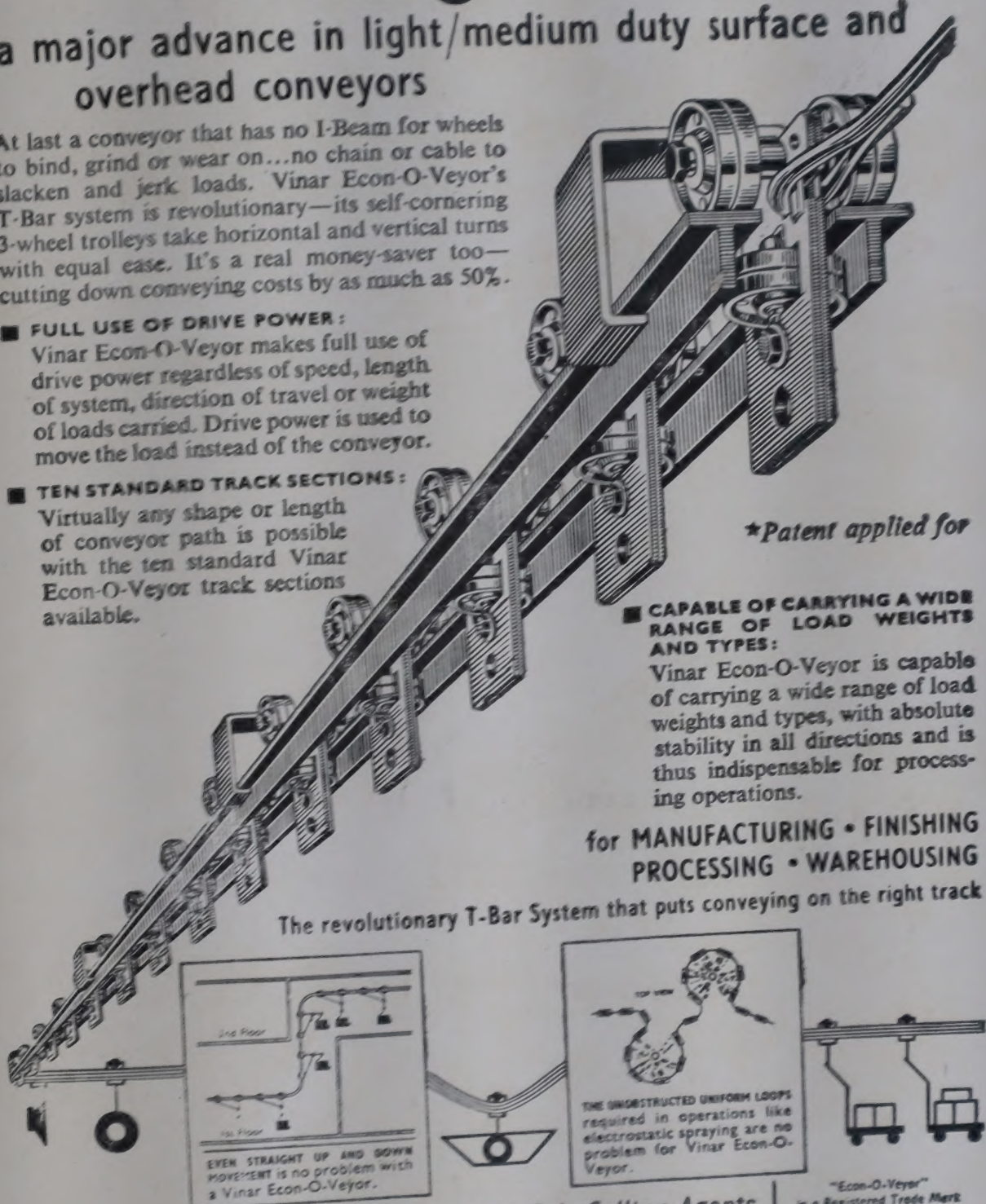
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